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Idaho Prescribed Fire Smoke Management Field Guide – to Support Rule Discussion

**Using Basic Smoke Management Practices to Protect Air
Quality in Idaho**



**State of Idaho
Department of Environmental Quality**

Final Date TBD

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Contents

1	Introduction.....	6
2	Purpose of this Guide.....	6
2.1	How to Use This Guide	9
3	Benefits of a Smoke Management Program	10
3.1	Smoke and Health.....	11
3.2	Idaho’s Smoke Management Program	12
4	Basic Smoke Management Practices	14
4.1	BSMP #1 – Evaluate smoke dispersion conditions to minimize smoke impacts.....	21
4.1.1	Smoke Dispersion Forecast	21
4.1.2	Weather Observations.....	23
4.1.3	Wind Direction	23
4.1.4	Fuel Conditions.....	23
4.1.5	Test Burn	25
4.2	BSMP #2 – Monitor the effects of the prescribed fire on air quality	26
4.3	BSMP #3 – Recordkeeping of BSMPs, prescribed fire activity, and smoke behavior ..	28
4.4	BSMP #4 – Communication - Public Notification.....	29
4.4.1	Public Education and Awareness.....	29
4.4.2	Communication Plans.....	30
4.4.3	Smoke-Sensitive Areas and Institutions with Sensitive Populations	30
4.5	BSMP #5 – Consider the use of emission reduction techniques (ERTs)	31
4.5.1	Alternative Treatments	31
4.5.2	Emission Reduction Techniques (ERTs).....	33
4.5.2.1	Reduce the Area Being Burned	33
4.5.2.2	Reduce Fuel Load.....	34
4.5.2.3	Reduce the Fuel Production	35
4.6	BSMP # 6 – Share the airshed to minimize impacts to the public - Coordination of area burning	35
5	What Prescribed Fire Type Do I Follow?.....	38
5.1	Recognized Smoke Management Group Member Burning:	40
5.2	Major Burning:	40
5.3	Minor Burning:	41
5.4	Short Duration Pile Burning:.....	41
5.5	Pile Sizes and Burn Options	43
6	Recognized Smoke Management Group	47
6.1	Certification of Smoke Management Group	48
6.2	Smoke Management Planning.....	49

6.3	Smoke Management Practices.....	51
7	Major Burning	54
7.1	Annual Coordination	56
7.2	Registration.....	56
7.3	Request to Burn	58
7.4	Burn Decision	59
7.5	Smoke Management Practices.....	60
8	Minor Burning	62
8.1	Registration.....	64
8.2	Notification of Intent to Burn	65
8.3	Burn Decision	67
8.4	Smoke Management Practices.....	68
9	Short Duration Pile Burning	70
9.1	Registration – Short Duration Pile Burning	72
9.2	Burn Decision-Short Duration Pile Burning	73
9.3	Smoke Management Practices – Short Duration Pile Burning	74
10	Prescribed Fire Rule General Provisions	77
10.1	Burn Decision – All Burning.....	77
10.2	Designated Burn Day	78
10.3	Limitations on Burning.....	79
10.4	Smoke Dispersion Forecast and Public Notification of Burn Day	80
10.5	Advisory Committee	81
11	Prescribed Fire Council	83
12	Smoke Management Training.....	84
	Acronyms	85
	Glossary	85

Tables

Table 1	Definition of Prescribed Fire	8
Table 2	Air Quality Information Sources	11
Table 3	Types of Dispersion.....	25
Table 4	Visual Range and Actions to Take to Reduce Smoke Exposure	27
Table 5	How to Determine What Type of Burning is Being Conducted.....	39

Figures

Figure 1 Prescribed Fire Objectives as Defined by DEQ	10
Figure 2 Particulate Matter Size Comparison.	12
Figure 3 Build Your Slash Pile to Promote Complete and Efficient Combustion.	24
Figure 4 Map of DEQ Monitoring Network	28
Figure 5 Map Example of Institutions Identified With Sensitive Populations.	31
Figure 6 Mastication is one example of an alternative to using prescribed fire.	32
Figure 7 Mosaic Burn Pattern.	34
Figure 8 Map of Possible Idaho Airsheds (draft).....	36
Figure 9 Map of Possible Idaho airsheds (draft).....	37
Figure 10 Major Burning Description.....	40
Figure 11 Minor Burning Description	41
Figure 12 Short Duration Burning Description	42
Figure 13 Hand Pile.	43
Figure 14 University of Washington Pile Calculator. Hand pile and machine pile construction.	44
Figure 15 Measuring and Building Piles.	45
Figure 16 Burn Day Flexibility.....	46
Figure 17 Timeline for Accomplishing Major Burning.....	55
Figure 18 Timeline for Accomplishing Minor Burning	63
Figure 19 Minor Prescribed Burning Map Example.....	67
Figure 20 Timeline for Accomplishing Short Duration Pile Burning	71
Figure 21 Short Duration Pile Burning Map Example	74

Appendices

Appendix A: How to Register Burn Projects.....	88
Appendix B: How to Make a Burn Request for Major Burning	91
Appendix C: How to Notify DEQ of Intent to Burn for Minor Burning.....	93
Appendix D: Meteorology Considerations for Burn Managers Making Smoke Management Decisions	96
Appendix E: Burn Managers: Determining if ignition is appropriate	97
Appendix F: How to Submit Burn Report	99
Appendix G: Developing a Public Awareness Strategy	100
Appendix H: How to get a Smoke Dispersion Forecast from NWS.....	101
Appendix I: How DEQ Makes a Burn Decision.....	104
Appendix J: DEQ General Smoke Forecast.....	106
Appendix K: Air Quality Index	109

1 Introduction

For years, effort and discussion has been underway to address the occurrence of large destructive wildfires. Since 1925, when the Idaho Forestry Act was passed, Idaho has employed an aggressive hazard fuel treatment standard through state rule requiring private property owners to manage slash. Federal and state land managers are accelerating treatment of hazard fuels, incentivizing and planning wildland-urban interface resiliency to handle the inevitable wildfire, and increasing the use of ecosystem burning. These solutions have a heavy reliance on the use of prescribed fire which will produce smoke that is detrimental to both nearby residents and community resources unless smoke management techniques are employed for all prescribed fire use.

Prescribed fire is primarily seen as a way to improve forest resiliency to wildfires, but it should also be seen as a way of protecting air quality and public health. Large wildfires emit vast amounts of pollutants. Limiting smoke impacts from all fire is an important issue for the Idaho Department of Environmental Quality (DEQ), land managers and owners, foresters, and contractors. An effective smoke management plan is needed to address the risks to public health and safety from current and future projected levels of prescribed fire activity.

This smoke management guide is a crucial part of Idaho's Prescribed Fire Smoke Management Program. Although this guide should not be considered authoritative or enforceable as rule, references to the rule are included for the user's convenience. This guide will be reviewed on an annual basis by DEQ and the Prescribed Fire Smoke Management Advisory Committee.

This guide was developed using many sources on the subject of prescribed fire and air quality. An effort was made to attribute these sources when used indirectly and when quoted specifically. Much of the credit for the content of [Section 4](#) of this guide goes to authors of the National Wildfire Coordinating Group (NWCG) Smoke Management Guide for Prescribed Fire, PMS 420-2, February 2018, and "Idaho Forestry Best Management Practices Field Guide" produced by Idaho Department of Lands. In addition, IDEQ worked closely with the Idaho Department of Lands, and interested stakeholders to develop the prescribed fire rules as well as many sections of this guide. Their input was invaluable to this effort.

2 Purpose of this Guide

This guide serves as a tool for implementing the Prescribed Fire rules and general smoke management practices. It is not enforceable like a rule, but provides guidance and tools for those conducting prescribed fire to maintain compliance with the Prescribed Fire rules (IDAPA 58.01.01.627-633) and to protect air quality. This guide is relevant to all persons conducting prescribed burning in Idaho, outside reservation boundaries. For purposes of this guide and Idaho air quality rules, the term "Person" is defined in IDAPA 58.01.01.006.83 as; *Any individual, association, corporation, firm, partnership or any federal, state or local governmental entity.*

Maintaining and improving Idaho's air quality is critical to protect human health and for continued economic stability of the state. High pollutant concentrations can result in direct health risks to citizens as well as expensive and burdensome regulations for their communities. With a

comprehensive smoke management program, Idahoans can coordinate burning to reduce pollutant concentrations and improve the overall health and vitality of all Idaho communities.

This guide provides an outline of how to comply with Idaho's prescribed fire smoke management rules (IDAPA 58.01.01.627-632) and recommends several smoke management practices to improve air quality and advance the use of prescribed fire for land management and fire protection purposes.

Coordinating the rules and priorities between state agencies, in addition to collaborating with landowners and operators, is critical to effectively protect natural resources. DEQ will work to improve understanding within partnerships to help ensure programs and plans continue to work cohesively.

Fire safety regulations also apply to prescribed fire. The Idaho Department of Lands or the local fire department should be consulted for specific information and interpretation about fire safety concerns in Idaho.

DEQ and the Idaho Department of Lands (IDL) define prescribed fire almost identically. DEQ's definition includes the extensive list of prescribed fire objectives to ensure these actions are allowed forms of open burning to help satisfy Clean Air Act requirements (differences are highlighted and in bold italics):

Table 1 Definition of Prescribed Fire

Department of Environmental Quality IDAPA 58.01.01.006.91	Idaho Department of Lands IDAPA 20.0.01.10.44
<p>The controlled application of fire to wildland fuels in either their natural or modified state under such conditions of weather, fuel moisture, soil moisture, etc., as will allow the fire to be confined to a predetermined area and at the same time produce the intensity of heat and rate of spread required to accomplish planned objectives, including:</p> <ul style="list-style-type: none"> a. Fire hazard reduction; b. The control of pests, insects, or diseases; c. The promotion of range forage improvements; d. The perpetuation of natural ecosystems; e. The disposal of slash and woody debris resulting from a logging operation, the clearing of rights of way, a land clearing operation, or a driftwood collection system; f. The preparation of planting and seeding sites for forest regeneration, and; g. Other accepted natural resource management purposes. 	<p>The controlled application of fire to wildland fuels in either their natural or modified state, under such conditions of weather, fuel moisture and soil moisture, to allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to meet planned objectives.</p> <p><i>*IDL Forest Practice Rules Guidance clarifies the term “modified state” used in their rule to mean: “jackpot or slash piles resulting from harvest and slash management activities”.</i></p>

Minimizing health impacts from smoke and the use of prescribed fire are not mutually exclusive goals. This is evidenced in IDL’s rules which require “burning operations to be planned, prepared, and executed in such a manner that forest resources are not damaged and air quality standards are met” (IDAPA 20.04.02.110.01). Making burn decisions using smoke management principles augment the purpose and intent of IDL hazard rules.

2.1 How to Use This Guide

This guide is organized to lead the user from a basic understanding of the benefits of smoke management through the introduction of six universally-applicable smoke management practices and how they are applied in Idaho. This guide provides the knowledge to use smoke management practices and ensure prescribed fire meets the requirements of Idaho's Prescribed Fire Rules.

To get started, burners should understand the need for protecting air quality from unnecessary smoke impacts. After identifying the type of prescribed fire burning being conducted by using Section 5, burn managers can skip to the section that is applicable to the size of burn being planned. Sections 6–9 explain the actions that burn managers must do before, during, and after a burn. The guide is laid out in the following manner:

Section 3 – Purpose of a smoke management program, health effects of smoke, and why it is necessary to manage smoke and protect air quality.

Section 4 – Smoke management practices and how to implement them. Individual icons are used to visually identify each of the six basic smoke management practices. These icons identify required smoke management practices for each burn category and provide reference between Section 4 and the prescribed fire burn type sections.

Section 5 – How burn managers can determine the burning type applicable to the planned prescribed fire activities.

Sections 6 – Information for members of a recognized smoke management group to fulfill the requirements of the rules.

Section 7 – Information for conducting Major Burning.

Section 8 – Information for conducting Minor Burning.

Section 9 – Information for conducting Short Duration Burning.

Sections 10 – 13 cover general provisions applicable to all burners, DEQ, the smoke management program, and additional resources. Several appendices are also included in this guide for specific actions (e.g., registering or requesting to burn, obtaining and understanding smoke dispersion forecasts).

This guide will be reviewed annually by DEQ and the prescribed fire smoke management advisory committee to include any new and improved techniques or technology. All burners should consider providing input into how the guide can be improved through the most appropriate representative group(s).

3 Benefits of a Smoke Management Program

Establishment of a smoke management program safeguards the use of fire for meeting prescribed fire objectives in Idaho. Idaho's smoke management program was designed to meet basic smoke management principles by using established prescribed fire practices in use by several organizations, agencies, and states around the country. The National Wildfire Coordinating Group identified smoke management practices which, when implemented, provide for safe, effective prescribed fire that will meet prescribed fire objectives while also protecting public health and safety. Idaho's smoke management program (SMP) was developed to support the need for effective prescribed fire while also protecting public health and safety. Idaho's program relies on currently available technology and techniques while remaining flexible enough to allow for inclusion of new smoke management techniques and technology as they emerge.

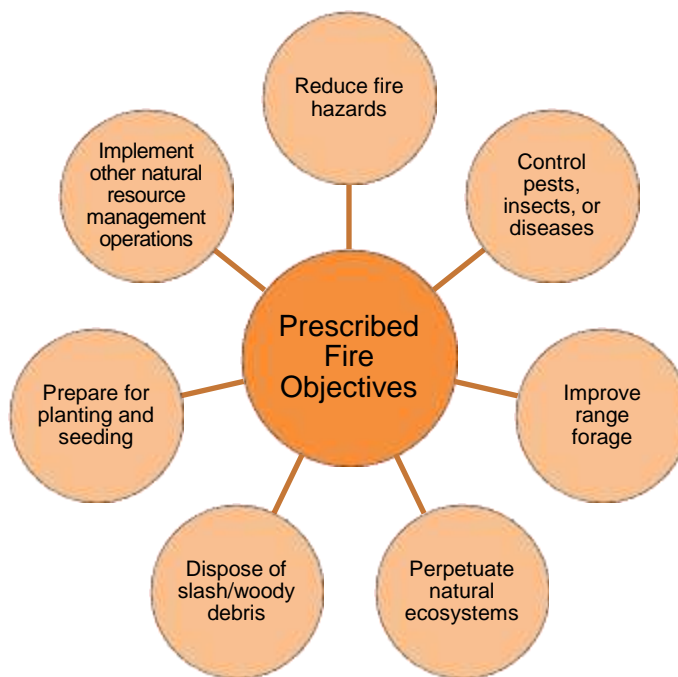


Figure 1 Prescribed Fire Objectives as Defined by DEQ

The purpose of Idaho's open burning rule, as described in IDAPA 58.01.01.600, is *to reduce the amount of emissions and minimize the impact of open burning to protect human health and the environment from air pollutants resulting from open burning as well as to reduce the visibility impairment in mandatory Class I Federal Areas in accordance with the regional haze long-term strategy.*

In addition to ensuring burning is supported, a smoke management program can also be instrumental in finding ways to support alternatives to burning. The use of mechanical treatment of slash is gaining in popularity because it allows for scheduled treatment of the material that is not dependent on weather and it also provides treatment options for those landowners who are less comfortable with using fire on their lands. Using alternatives are often very costly when compared to the cost of burning to dispose of debris. Finding additional uses for waste material from logging, which can be as high as 30 percent in some instances, is also an emerging topic. A

smoke management program can be instrumental in identifying and securing funding for these type options.

3.1 Smoke and Health

Smoke from burning contains airborne particles that can make breathing difficult and lead to serious short-term and chronic health problems for sensitive populations (e.g., the elderly, children, those with lung or heart illnesses).

One of the components of smoke is particulate matter (PM), which is divided into two groups: PM10 and PM2.5. PM10 is PM smaller than 10 microns and PM2.5 is PM smaller than 2.5 microns. These particles cannot be seen with the naked eye and are easily inhaled into the respiratory system (Figure 2).

The Environmental Protection Agency (EPA) established health-based *National Ambient Air Quality Standards (NAAQS)* for six pollutants: carbon monoxide, lead, ozone, nitrogen dioxide, PM, and sulfur dioxide. The NAAQS are set at a level that is protective of sensitive populations. EPA developed the Air Quality Index (AQI) to convey potential health effects of differing concentrations for all NAAQS. More information about air quality standards, PM, and the AQI can be found below.

Table 2 Air Quality Information Sources

Topic	Link
NAAQS Guidelines for PM	https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm
PM Basics	https://www.epa.gov/pm-pollution/particulate-matter-pm-basics
AQI and Your Health	https://www.epa.gov/wildfire-smoke-course/wildfire-smoke-and-your-patients-health-air-quality-index

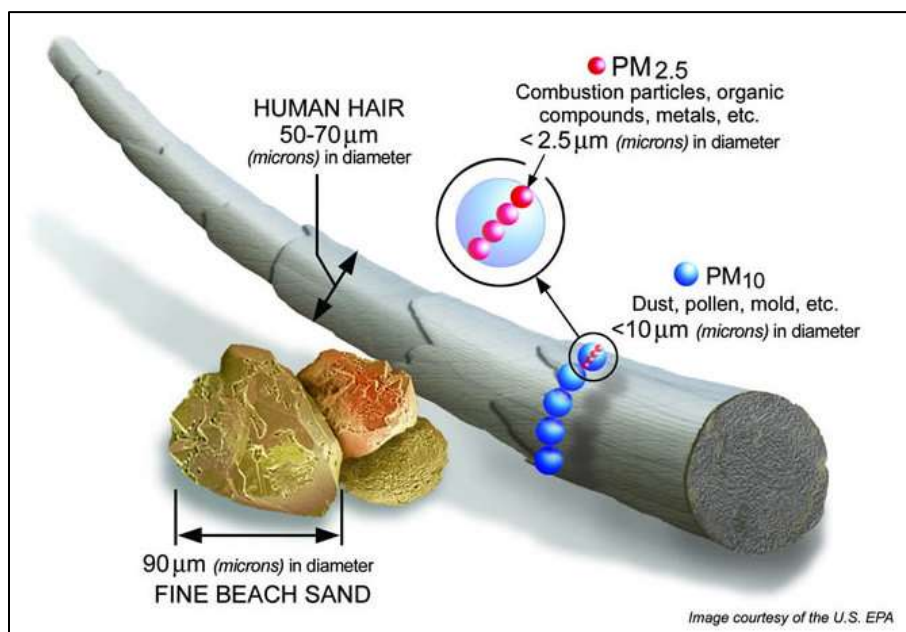


Figure 2 Particulate Matter Size Comparison.

PM 2.5 is nearly 28 times smaller than the width of a human hair and 36 times smaller than a grain of sand. This size of particle can easily be inhaled into the lungs and cause respiratory problems.

Prescribed fire smoke poses a major health risk if not managed properly. Symptoms from short-term smoke exposure range from scratchy throat, cough, irritated sinuses, headaches, runny nose, and stinging eyes to more serious reactions among sensitive populations. Sensitivity to smoke depends on the level and duration of exposure, age, individual susceptibility, including the presence or absence of lung and heart disease, and other factors. Most healthy individuals recover quickly from short-term smoke exposure.

3.2 Idaho's Smoke Management Program

Idaho's smoke management program supports for the use of prescribed fire while also protecting public health and the NAAQS. The backbone of the smoke management program is widespread use of the basic smoke management practices (BSMPs). All participants of the smoke management program, burners and DEQ, will use the practices that are appropriate for their role in the burn.

Basic smoke management practices (BSMPs) are a set of six universally-applicable activities which help manage, track, and reduce the effect of prescribed fire on air quality. Although all six are not always appropriate, these BSMPs should always be considered for use in addition to local burn requirements such as obtaining a permit or participating in a state smoke management program (NWCG, *Smoke Management Guide for Prescribed Fire*, 2018). The six smoke management practices are:

- Evaluating smoke dispersion conditions to minimize impacts
- Monitoring effects of fire on air quality

- Recording BSMPs, fire activity, and effects
- Communicating and notify authorities and the affected public
- Utilizing emission reduction techniques whenever possible
- Collaborating with nearby burners to manage smoke emissions

Some of these techniques will be implemented by the burner, others will be the responsibility of DEQ, and some may have applicability in both areas of responsibility. Section 4 will outline the BSMPs and provide detail on how each burner may use them to accomplish their prescribed fire objectives.

4 Basic Smoke Management Practices

This section discusses the six BSMPs, how Idaho incorporates them into the smoke management program, how burners should implement these practices, and discusses additional options to reduce prescribed fire smoke. The six BSMPs appearing in this section are taken from NWCG, Smoke Management Guide for Prescribed Fire, 2018, pp107. Not all BSMPs are applicable for all burn types.

In addition to the six BSMPs all burners should consider the following whenever planning a burn project:

- Is burning appropriate? Are there alternatives to burning that are reasonably available?
- When is it appropriate to burn? The seasonal timing of burn, what weather conditions are needed to support good smoke management results and meet the objectives of the burn.
- Where is it appropriate to burn? Is the location of material an appropriate location that will support good smoke management results and meet the objectives of the burn?
- What is appropriate to burn? Is the material free of stumps, soil, or other conditions that will inhibit complete combustion? Is there prohibited material in the pile? Am I burning large logs that can be used for other purposes (i.e., firewood, habitat, etc)?
- How should burning be conducted? Do I have emission-reduction techniques in mind while planning (i.e., building the pile, planning the burn period)?

BSMP #1: Evaluate smoke dispersion conditions to minimize smoke impacts



- **DEQ:**

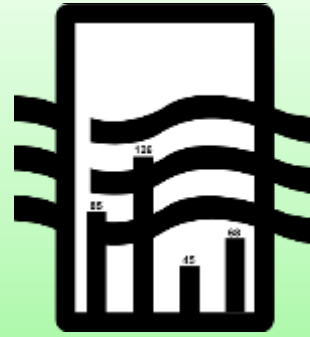
- Identifies the locations of proposed burns through burner registration.
- Identifies and maps smoke sensitive areas and institutions with sensitive populations.
- Evaluates current and forecasted weather conditions to forecast where smoke may go and the degree of potential impacts to the public. DEQ will use established weather and smoke forecast tools in conjunction with location and the estimated amount of material to be burned on a given day based on registration information.
- Publishes a daily smoke forecast

- **Burners(if applicable to the burn size):**

- Track weather forecasts to help identify the most appropriate day for burning. DEQ's daily smoke forecast can also be used.
- Obtain a smoke dispersion forecast specific to the burn location the morning of the burn, prior to ignition.
- Evaluate the smoke dispersion forecast to determine weather it supports ignition. Verify that actual weather conditions at the burn location match the smoke dispersion forecast.
- Use a test burn to confirm good smoke dispersion
- Observe smoke behavior during and after the burn

- See Section 4.1 for more information on this BSMP

BSMP #2: Monitor the effects of the prescribed fire on air quality



- **DEQ:**

- Maintains an extensive network of air quality monitors
- Uses field reports from regional DEQ offices
- Observes webcams located around the state
- Evaluates smoke complaints

- **Burners (if applicable to the burn size):**

- Conduct a test burn,
- Observe the behavior of the smoke during and after the burn, including:
 - how high it lofts,
 - whether it disperses well or remains tight and dense, and
- Periodically reassess air quality and adjust ignition as necessary.

- See Section 4.2 for more information

BSMP #3: Recordkeeping of BSMPs, prescribed fire activity, and smoke behavior



- **DEQ:**
 - Maintains records of daily burn decisions
 - Maintains records of daily smoke dispersion forecast
 - Retains air quality monitor data
 - Retains records of complaints and resolutions
 - Requests records from burners when there is an unexpected smoke impact
 - Uses records to demonstrate an Exceptional Event when necessary
- **Burners (if applicable to the burn size):**
 - Keep records of the BSMPs used and include:
 - copy of the smoke dispersion forecast
 - weather conditions before, during, and after the prescribed fire
 - number of acres or piles burn
 - location, date, and ignition time of the burn
 - fuel type and fuel consumption
 - actual smoke behavior and impacts
 - Record-keeping can be as simple as keeping a personal journal and could be very important if a smoke crosses a road, affects a smoke sensitive area, or contributes to an exceedence of the NAAQS.
- See Section 4.3 for more information

BSMP #4:

Communication - Public Notification



- **DEQ:**
 - Identifies the smoke-sensitive areas and institutions with sensitive populations and posts on the DEQ website.
 - Posts the daily burn decision and approved burns.
 - Notifies burners of any changes in weather or air quality that restrict burning after approval was given.
- **Burners (if applicable to the burn size):**
 - Notify appropriate fire protection agencies and people that could be potentially affected by the smoke.
 - For larger broadcast burn, prepare contingency actions for use during and after the prescribed fire to reduce smoke exposure in smoke sensitive areas or at institutions with sensitive populations.
- See Section 4.4 for more information

BSMP #5: Consider the use of emission reduction techniques (ERTs)



- **DEQ:**

- Encourages the use of emission reduction techniques and alternatives to burning whenever feasible.
- Works with local and national organizations to increase the availability of emission reduction techniques and alternatives to burning.
- Works with local and national organizations to educate the burners on emission reductions techniques.

- **Burners (if applicable to the burn size):**

- Consider methods for reducing emissions which will reduce downwind effects. Care should be taken to ensure the ERTs are appropriate for the site and will still allow burn objectives to be met.
 - Consider other uses for slash material
 - Build clean piles free of dirt and stumps
 - Ensure the pile is dry
 - Take care to only include small diameter fuels that will burn quickly and efficiently
- Section 4.5 covers alternative fuel treatments and emission reduction techniques and how to implement them.

BSMP #6: Share the airshed to minimize impacts to the public - Coordination of area burning



- **DEQ:**
 - Implements the smoke management program and open burning rules to ensure that all burning is accounted for when making the burn decision.
 - Develops a communications and information-sharing network among fire managers who may be in the prescribed fire vicinity on the same day or who could cumulatively affect a smoke sensitive receptor.
 - Coordination and planning of ignitions to cooperatively schedule prescribed fires to avoid overwhelming the ability of the atmosphere to disperse smoke from multiple prescribed fires.
- **Burners (if applicable to the burn size):**
 - Register their burn projects
 - Verify approval to burn prior to ignition
 - Request to burn or notify DEQ of their intent to burn
 - Verify that burning project is not limited the day of their burn
- See Section 4.6 for more information



4.1 BSMP #1 – Evaluate smoke dispersion conditions to minimize smoke impacts

4.1.1 Smoke Dispersion Forecast

A successful burn project uses weather observations and forecast models to help predict the transport and dispersion of smoke from prescribed fires during the initial ignition phase of a burn. Meteorological data including local atmospheric mixing indicators, ventilation matrices, and interpreting planetary boundary level forecasts, are just some of the tools being used to make informed smoke management decisions for prescribed fire use. Expected duration of the burn is also important when considering smoke dispersion conditions. If the proposed burn unit may be active for multiple days, then multiple days of weather forecasts and conditions should be used to identify the appropriate burn window.

State and federal land managers have the ability to request a spot weather forecast from the National Weather Service. Qualified burners should request a spot weather forecast including smoke management criteria before each planned ignition. A spot weather forecast should begin at the planned ignition time and include a forecast for that day and night.

Burners who do not qualify for this service may request a smoke dispersion forecast through other means. The NOAA Fire Weather website (www.weather.gov/fire) has a wide variety of national and regional fire weather information. *Appendix H: How to get a Smoke Dispersion Forecast from NWS*, describes how a burner can obtain a smoke dispersion forecast and what conditions can impact smoke dispersion.

A smoke dispersion forecast will include:

Temperature. Affects fuel dryness, how fuel will burn, as well as how well the smoke will rise above ground level and if it will likely reach a suitable height for proper smoke ventilation for the burn area.

Surface wind speed and direction. Critical for fire safety and expected ground level smoke movement. Extreme surface wind speeds, too high or too low, are undesirable. High surface winds can be a fire safety hazard as well as cause the smoke plume to “lay over” close to the ground. The lack of any surface winds may also be undesirable as this could inhibit flame spread and smoke dispersion.

Transport wind speed and direction. Helps determine if smoke-sensitive areas or institutions with sensitive populations could be impacted by prescribed fire smoke.

Mixing height. Helps determine ventilation potential by providing feedback on how high smoke might be able to mix up to.

Precipitation potential. Too much precipitation during an active burn could greatly affect the vertical rise of the smoke and cause smoke to stay at or near ground level.

Relative humidity. While higher relative humidity may be good for fire safety, excess moisture in the air could cause excessive smoldering or little to no vertical smoke rise.

Haines Index. Measure of how dry and stable the atmospheric conditions near the earth's surface are. Values of 5 or 6 indicate moderate and high potential for extreme fire behavior. A 2 or 3 indicate very low potential.

Burners should take advantage of the atmospheric conditions that will promote the best smoke management conditions possible for burn objectives.

Some of the atmospheric conditions (e.g., precipitation, relative humidity, and temperature) can be the difference between a burn that is able to combust during the flaming phase where less smoke is produced and one that mostly smolders, producing additional smoke near the ground. Dry wood and dry, warm temperatures allow the fuel to burn more efficiently. Damp wood and wet weather mean a slower, smokier burn.

Wind speeds, wind direction, and mixing height help burners determine if smoke will lift, how far it could travel, and in what direction. Higher mixing height and windier weather allow the smoke to lift and disperse so that it does not settle near the surface and cause impacts. The direction of the wind is important because it will determine if smoke will impact nearby smoke-sensitive areas and institutions with sensitive populations.

Late afternoon ignition times may not leave enough time to lift and transport the smoke away before sunset when smoke tends to settle into valleys for the night. However, broadcast type burn objectives may necessitate an ignition time later in the day or evening. If burning is to be conducted late in the day or evening, this should be communicated in the annual coordination planning meetings or burn registration information.

The following tools are available to estimate smoke plume transport direction and relative impacts:

Simple smoke tool. <http://fireweather.fdacs.gov/Simple-Smoke/> The Simple Smoke Screening Tool is a simple graphical smoke tool produced by the Southern High Resolution Modeling Consortium but is available online for any burner. Locate where your burn will be on the map, enter the acres, ignition type, and the forecast wind direction and it will give you a simple diagram of where your smoke could travel, divided into two impacts zones. The first zone (colored red) is used to identify the area most likely to be affected by smoke. If there are smoke-sensitive areas or ISPs within this critical zone burning is not recommended under the current weather conditions.

V-Smoke tool. <http://weather.gfc.state.ga.us/googlevsmoke/vsmoke-good2.html> Vsmoke-Web is a very similar tool to the Simple Smoke Screening Tool but asks for inputs and has a more detailed output of possible smoke impacts. The projected smoke dispersion is color-coded to match the PM2.5 Air Quality Index – the red zone indicates areas that may see a level of smoke concentration that is unhealthy, the orange zone indicates the smoke concentration would be unhealthy for sensitive groups, etc (see Appendix K for more details

about the Air Quality Index). If there are smoke sensitive areas or institutes with sensitive populations (ISPs) within the orange, red, purple, or maroon contours, burning is not recommended under the current weather conditions.

Daily smoke dispersion forecast. DEQ provides a smoke dispersion forecast daily. Burners can sign up to have it emailed to them during the spring and fall burning season or they can find it on the DEQ website. An example can be found in *Appendix J*.

4.1.2 Weather Observations

Prior to beginning the burn, the burn manager needs to observe the weather at the location of the burn. Go through the list of weather parameters in Section 4.1.1 and verify each of them on site. As they observe the weather, the burn manager should pause to ask themselves if the following on-site conditions still support conducting the burn:

- Does the temperature and humidity support dry fuel conditions? Will it allow for a burn that consumes fuel during the flaming phase or the smoldering phase?
- Does wind direction and speed support smoke dispersion? Will the smoke go towards an ISP or SSA?
- Does the mixing height allow for adequate vertical dispersion of the smoke? Will the smoke be trapped by an inversion?

The weather observations are relative. What are good conditions in the winter may not be good conditions in the spring. For example, in winter, there are very few days with a good mixing height. In this case, a mixing height of at least 2,000 ft. above ground level may be enough to proceed with the burn if there is no inversion and the wind direction and speed are correct for that location. In the spring, on the other hand, 2,000 ft. of mixing height is fairly poor. There will be many days where the mixing height is greater than this and the burner should wait for a day with a higher mixing height and proper wind speed and direction.

4.1.3 Wind Direction

When making the decision to begin ignition, burn manager should be confident that wind directions and speeds present at the site will take the smoke away from ISPs and smoke sensitive areas. Observing smoke behavior downwind from the burning will help to mitigate possible impacts. Complete burn as soon as possible in the afternoon to avoid trapping smoke during nighttime inversions.

4.1.4 Fuel Conditions

One of the more important characteristics of fuel is the amount of fuel to burn, known as fuel bed loading. It can vary widely amongst project types and fuel type. Higher fuel bed loading generally equates to more fuel consumption and emissions.

Fuel moisture is another important condition because it influences the amount and rate of consumption as well as the flame temperature and subsequent burn efficiency. Generally, fuels with low moisture content burn more efficiently and produce less smoke. However, total

emissions may be reduced when burning moist fuels in a broadcast burn if less fuel burns—typically the large, woody fuels and forest floor consume less under moist fuel conditions. The burn manager, or designee, should confirm fuel conditions will support adequate combustion before ignition.

Use pile burning when possible. Be sure to burn dry and clean material. Pile burning offers flexibility in burning schedules and decreases the chances of smoke impacts on nearby smoke-sensitive locations if the piles are dry and not mixed with dirt. A pile that has aged 5–6 months is usually sufficiently dry to begin burning. Temporarily covering piles in the winter will limit moisture and improve fuel conditions. Another way to limit smoke from piles is to build a clean pile. Building a pile by hand or with a machine that limits soil buildup will create a clean pile. DEQ and the Idaho Department of Lands recommend:

- Fully cure slash piles (5-6 months is usually sufficient) prior to ignition. Piles should be less than 10 feet in diameter and 6 feet tall.
- Partially or fully cover slash piles with a water-resistant material if the plan is to ignite only after precipitation events occur when fire danger is lowest. If using plastic or other material that is prohibited from burning to cover the piles be sure to remove this material prior to ignition.

NOTE: The use of polyethylene as a cover that can be left on the pile and burned is currently being researched as a possible option, however at this time burning any kind or amount of plastics is prohibited in Idaho.

- Compact slash and large woody debris piles and make sure they are free of stumps, soil, snow, and non-woody material.



Using a dirt blade to pile slash usually means the piles will have enough dirt in them so the pile will be difficult to light, will not burn completely, must be monitored long after it is lit, and the pile may have to be re-piled and burned again to get adequate burning.

IDL Forestry Forum

Figure 3 Build Your Slash Pile to Promote Complete and Efficient Combustion.

Photo courtesy of Roger Ottmar, US Forest Service PNW Research Station, Pacific Wildland Fire Sciences Laboratory

4.1.5 Test Burn

Test burns are an important step in the decision making process. Once the burn manager has made the decision to attempt ignition, they will conduct a test burn before igniting the entire project. The purpose of the test burn is to verify that the prescribed burn will behave as expected and smoke will disperse as predicted.

For broadcast burning, a test burn is used to confirm adequate vertical and horizontal smoke dispersion and adequate fuel burning rate that promotes consumption of fuel by flaming phase. The ignition plan should include milestones, or breakpoints, when ignition is halted briefly to complete a smoke dispersion observation in order to determine if additional burning should proceed.

If burning piles, choose one pile that is representative of the piles that you plan to burn that day. Light the pile and observe the smoke production and direction that it travels. Consider evaluating:

- Is smoke rising vertically?
- Is it dispersing horizontally?
- Is it hitting an inversion and stopping?

If the smoke is dispersing well and not getting trapped by an inversion, light another pile and continue to evaluate dispersion. If the smoke is NOT dispersing well, do not light another pile. Continue to evaluate dispersion and adjust ignition as needed.

Table 3 Types of Dispersion.



Good Dispersion	Poor Dispersion
	

Photo Left: courtesy of Roger Ottmar, US Forest Service PNW Research Station, Pacific Wildland Fire Sciences Laboratory. **Photo Right:** DEQ



4.2 BSMP #2 – Monitor the effects of the prescribed fire on air quality

Burn managers should integrate the monitoring of smoke plumes, smoke movement, and accumulations of ground level smoke into burn planning and implementation in order to document any effects their management actions may have on air quality. There are many ways to monitor smoke and the method selected should balance the need for information with available resources. Monitoring smoke can be as simple as standing on a ridge and watching and recording which way the plume goes. Stationing personnel at a high point or other appropriate lookout to observe and document smoke transport, dispersion, and accumulation may be sufficient. Notes and photographs can provide good documentation of smoke movement and may be especially important to have if something goes wrong (NWCG p.234-242).

DEQ has an extensive network of air quality monitors throughout the state (Figure 4). DEQ also uses monitors operated by other agencies within Idaho to evaluate the smoke decisions. Despite the extensive monitoring network, there are areas throughout the state that are not monitored. It is still important to protect the health of people in these areas even if there isn't a monitor to gauge air quality. In the absence of nearby monitoring equipment, an estimate of the condition of the local air quality can be made by using visibility.

Table 4 Visual Range and Actions to Take to Reduce Smoke Exposure **

Distance Seen	Population Type		OR	Specific Illness
	A Healthy Adult, Teenager, or Older Child	Older adults (≥ 65 years), Pregnant, or a Young Child		Asthma, Respiratory Illness, Lung or Heart Disease
> 10 miles	Watch for changing conditions and moderate outdoor activities based on personal sensitivity	Watch for changing conditions and moderate outdoor activities based on personal sensitivity		
5-10 miles	Moderate outdoor activity	Minimize or avoid outdoor activity		
< 5 miles	Minimize or avoid outdoor activity	Stay inside or in a location with good air quality		
<ol style="list-style-type: none">1. Avoid sunrise or sunset when the sun is low on the horizon. Relative humidity must be below 65%.2. Face away from the sun.3. Determine the limit of your visible range by looking for targets at known distances (miles). The darker the target, the better. A black target is better than a green target.4. "Distance Seen" is that point at which even high contrast objects totally disappear.5. Use the chart to determine actions you should consider for your level of sensitivity or tolerance to smoke.				

** Because of the uncertainty of this estimation method, individuals must use their own judgement when assessing conditions.

**Sensitivity to smoke can vary greatly from person to person and individuals can become more sensitive to smoke after extended periods of exposure. Individuals should pay attention to the advice of a medical professional or local health officials and adjust activity accordingly to their particular tolerance or sensitivity.

To use visibility as a tool, the observer will need to stand with their back to the sun and look for landmarks of known distance (e.g., mountain ranges, buildings, etc). Darker landmarks will show up better and will be easier to distinguish from the surroundings. The further the most visible landmark is, the better the air quality. For example, if a landmark that is 20 miles away can easily be seen, the air quality is likely not affected by the prescribed fire smoke. Conversely, if a landmark that is 5 miles away cannot be easily seen, there is smoke buildup in the area. Cessation of additional burning should be considered in this case.

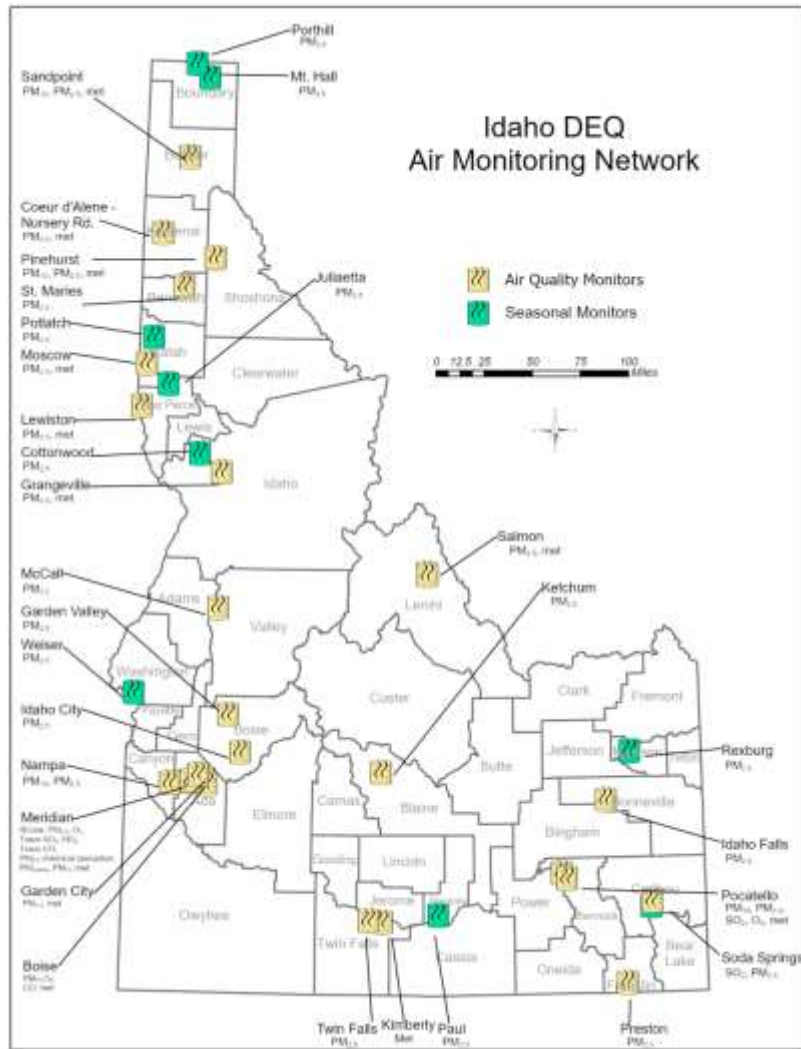


Figure 4 Map of DEQ Monitoring Network



4.3 BSMP #3 – Recordkeeping of BSMPs, prescribed fire activity, and smoke behavior

All burn managers, regardless of burn type, are encouraged to keep records. Documenting field conditions during a burn and the smoke behavior is invaluable for future burn success for the burner and the smoke management program as a whole. The information collected will be valuable for making informed burn decisions in the future.

Having access to information about the smoke dispersion, the meteorological conditions before, during, and after the burn; how ignition proceeded; and how long the burn took can inform future burn decisions and help document possible exceptional events.

Burners should record the following:

- On-site weather conditions during the day of ignition. Records should include observations before, during, and after the ignition and the time of day the observations were made.
- Smoke conditions observed during and after the burn and smoke impacts on any populated area as a result of the burn.
- The condition of the fuels being burned and the results of any test burn.



4.4 BSMP #4 – Communication - Public Notification

4.4.1 Public Education and Awareness

DEQ posts daily burn decisions for burner notification and public awareness. This informs the public where burning may occur each day so they can prepare for possible smoke impacts and protect their health. The burn decision and any burn approvals are posted on DEQ's website and via hotline, email, and text service when available.

DEQ operates an Emergency Rule for addressing this BSMP. When particulate concentrations reach and persist, or are forecasted to reach and persist, at or above the NAAQS, DEQ issues an Air Pollution Forecast and Caution. The issuance of an Air Pollution Forecast and Caution prohibits open burning (IDAPA 58.01.01.550). It is issued to protect public health by protecting the NAAQS. Additionally, DEQ is partnered with several counties, cities, and fire protection districts to protect air quality through the use of local burn restriction ordinances.

Public awareness must continually be considered. For prescribed fire smoke impacts to be eligible for exceptional event consideration a community's smoke readiness will be a factor. It is necessary to continue ongoing education on the use of prescribed fire and notifying communities when and where fire will occur is necessary. Public awareness and education could include:

- DEQ's Emergency Rule per IDAPA 58.01.01.550-562 criteria
- Notification of size or duration of burns when exceeding a specified limit
- Burns within specific proximity to communities
- Programs that build Smoke Ready community support would be appropriate in areas likely to experience prescribed fire smoke annually

Information about seasonal burning plans issued from burning groups, prescribed fire advocacy groups, regulatory agencies, or individuals to communities that are in proximity of prescribed fire would be considered a form of public awareness. Most federal land management burn plans attempt to meet these basic smoke management practices. Minor burning and short duration burning could rely on Idaho's Prescribed Fire Council to develop and distribute public awareness about seasonal burning and educational information about the need for prescribed fire and smoke management regulations. Smoke management groups should also consider using public education and awareness tools to promote the use of fire. Local regulations regarding prescribed fire and open burning should be adhered to before using prescribed fire on any project.

4.4.2 Communication Plans

All burners should consider developing a communication strategy to address how they will communicate with their neighbors, communities, smoke management program, and local officials regarding smoke issues. The plan should also address how the burner will handle any concerns that arise before, during, or after the burn. Communication is most effective when it is proactive and ongoing.

A prescribed fire council or smoke management group can enhance communication efforts. The public needs to know that all burn decisions consider smoke dispersion and burners are prepared to cease ignition if smoke is causing an impact. Building this relationship and trust with neighbors and surrounding communities goes a long way towards easing the negative perception of smoke.

Burn days are determined during the afternoon of the day before. In rare cases, DEQ may need to contact a burner when a prescribed fire is no longer allowed due to an emergency episode or when smoke is actively creating a persistent adverse impact. Every effort will be made to avoid such situations, but the situation does rarely occur. In order to communicate directly with burners, DEQ will acquire contact information for each burner.

4.4.3 Smoke-Sensitive Areas and Institutions with Sensitive Populations

Smoke sensitive areas are areas in which smoke from outside sources is intolerable, for reasons such as heavy population, existing air pollution, intensive recreation or tourist use, or institutions with sensitive populations. Hospitals, nursing home, daycare centers, schools, and residential areas are all examples of institutions with smoke-sensitive populations. When making a burn plan, burn managers should map their burn project in relation to these institutions and determine which wind directions should be avoided to limit downwind impacts and to determine who they should notify of their intent to burn.

DEQ includes known ISP locations and smoke-sensitive areas on the Prescribed Fire Map. ISPs were initially identified during the implementation of the Crop Residue Burning program. The State of Idaho provided the locations for all the schools and the Idaho Department of Health and Welfare provided the location for hospitals and assisted living facilities. DEQ relies on the regional DEQ staff to verify the locations of ISPs whenever they are working in the field so that the map is up to date.

Burners should consider probability of smoke impacting ISPs when determining to ignite. In addition, DEQ recommends that burners notify nearby communities and ISPs about the burn before ignition. Community members can also reference the Prescribed Fire Map to see if burning has been approved in their area.

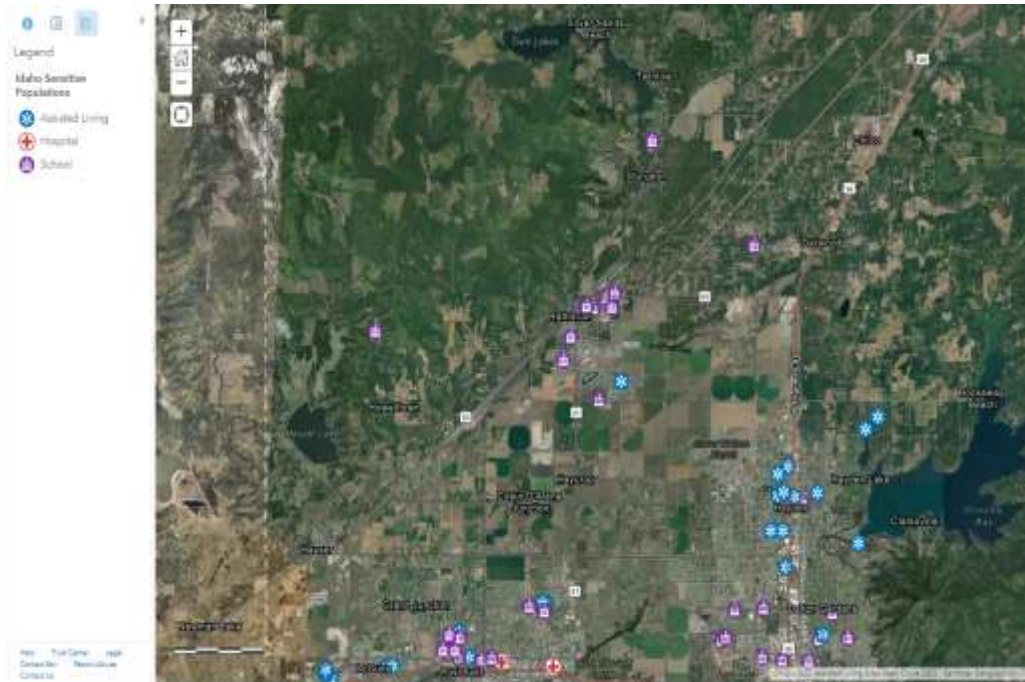


Figure 5 Map Example of Institutions Identified With Sensitive Populations.



4.5 BSMP #5 – Consider the use of emission reduction techniques (ERTs)

4.5.1 Alternative Treatments

There are alternatives to prescribed fire that reduce fuel loads and smoke production while also accomplishing land and slash management goals. There are four categories of alternative treatments: manual, mechanical, chemical, and grazing (NWCG 2018). A land management plan will often include alternative treatments in order to meet all the goals of the area and to ensure all options for hazardous fuel reductions are considered.

Manual. These alternatives use manual labor (e.g., cutting, scattering, piling) to change the fuel load. These methods can include cutting and scattering or piling the materials to change the fuel load. This reduces the risk of wildfire, but is limited by the scope of manual tools and access to the site. Identifying and developing marketable solutions for slash generated in

areas close to infrastructure should also be included when discussing this alternative treatment option. Selling the material as firewood, for example, would be a good use. However, sales are limited by the demand for firewood in a particular area.

Mechanical. Mowers, chippers, grinders, and masticators break down the fuel into smaller pieces and may remove the slash when done. However, this method is limited by access to machinery, site accessibility, and the soil’s ability to accommodate additional nutrient/biomass.



Figure 6 Mastication is one example of an alternative to using prescribed fire.

(Jesse K. Kreye, J. Morgan Varner, and Leda N. Kobziar *MECHANICAL MASTICATION AS A FUELS TREATMENT IN SOUTHEASTERN FORESTS*)

Chemical. These treatments don’t remove fuel but can kill or inhibit growth of unwanted plants to reduce future fuel load. Chemical methods can alter the overall ecosystem and can be harmful to humans and wildlife.

Grazing. Similar to chemical methods, grazing by ungulates can reduce the fuel load of an area but can also alter the ecosystem due to trampling and defecation.

It’s possible for communities to share resources (e.g., machines, equipment) to accomplish management goals. There is also a push to make communities in the wildland-urban interface more knowledgeable about prescribed fire smoke, or “Firewise.” One of the methods used in the Firewise program includes changing landscapes to make them resistant to fire—the removed material would be a good candidate for mechanical treatment.

4.5.2 Emission Reduction Techniques (ERTs)

Every prescribed burn should consider ERTs due to their potential to protect air quality; however not all techniques are appropriate to every situation. In certain cases, techniques to reduce emissions can impair or prevent the accomplishment of land management objectives, be too expensive, or negatively affect other valuable resources (*NWCG 2018*).

There are several ERTs to consider for every type of burn. The sections below provide resources to use when considering reduction techniques for individual burns.

4.5.2.1 *Reduce the Area Being Burned*

Burners can reduce smoke emissions by only burning a portion of the area within a designated perimeter. Examples of specific techniques from *NWCG Smoke Management Guide for Prescribed Fire, PMS420-2, February, 2018* that reduce the area burned include:

- **Burn Concentrations.** Sometimes natural concentrations of fuels can be burned rather than burning the entire area. This technique is generally used where the fuel loading is high.
- **Isolate Fuels.** Large logs, snags, deep pockets of duff, sawdust piles, squirrel middens, and other fuel concentrations that have the potential to smolder for a long time can be isolated from the prescribed fires and left unburned.

This can be done by:

- Constructing a fireline around fuel bed components that could produce a large amount of smoke to be left unburned
 - Not lighting individual or concentrated fuels
 - Using natural barriers (e.g., rock outcroppings, residual snow)
 - Scattering the fuels
 - Spraying fuels with fire retardant. Preventing these fuels from burning is often faster, safer, and less expensive than mop-up operations.
- **Mosaic Burning.** Landscapes often include fuel types that are discontinuous and vary in their fuel moisture content. Fire prescriptions and lighting patterns can be assigned to use this fuel and fuel moisture heterogeneity to mimic a natural wildfire and create patches of burned and unburned areas or to burn only selected fuels.



Figure 7 Mosaic Burn Pattern.

Parts of the Tripod Fire in 2006 burned in a mosaic pattern of trees of different ages, which can prevent large scale contiguous burns. It's evidence that prescribed fire and thinning can make forests more resilient. (U.S. Forest Service <https://www.govtech.com/fs/perspectives/Learning-to-Live-with-Wildfires-How-Communities-Can-Become-Fire-Adapted.html>)

4.5.2.2 Reduce Fuel Load

Emissions can be reduced when fuel is permanently excluded from burning. Examples of specific techniques from NWCG Smoke Management guide for Prescribed Fire, PMS420-2, February, 2018 that reduce the fuel load include:

- **Mechanical removal:** Mechanical removal of logging debris from timber harvest sites, onsite chipping of woody material or brush for use offsite, and mechanical removal of fuels which may or may not be followed by offsite burning in a controlled environment such as around homes in the wildland urban interface. Mechanical treatments (such as whole-tree harvesting) may sufficiently reduce fuels so that burning is unnecessary.
- **Mechanical Processing:** Mechanical processing of dead and live vegetation into wood chips or shredded biomass is effective in reducing emissions if the material is removed from the site or biologically decomposes. If the biomass is spread across the ground as litter fuel, emission reductions are not achieved if that litter is later consumed either in a prescribed or wildfire.
- **Firewood sales:** Firewood sales may facilitate sufficient removal of woody debris, making onsite burning unnecessary. This technique is particularly effective for piled material easily accessible to the public. It is generally applicable in forests with large diameter trees.
- **Biomass utilization:** Woody biomass can be removed and used to provide electricity in regions with cogeneration facilities. Woody material can be used for many purposes other

than fire, including as pulp for paper, methanol production, wood pellets, garden bedding, and specialty forest products. Demand for these products varies widely from place to place and from year to year.

- **Ungulates:** Grazing and browsing live grasses or brush by sheep, cattle, or goats can reduce fuels before burning, or reduce the burn frequency. Goats will sometimes eat even small, dead woody biomass. However, ungulates are selective, favoring some plants over others. The cumulative effect of this selectivity can significantly change plant species compositions.

If overall fuel load cannot be reduced, it may be best to reduce the amount of fuel burned in a single day. Smaller daily loads are more efficient and likely to finish burning before sunset when meteorological conditions shift to decrease overall smoke dispersion.

4.5.2.3 Reduce the Fuel Production

Long-term management techniques may modify the predominate species composition of an area to produce less biomass per acre or produce biomass that is less likely to burn, or that burn more efficiently. Examples of specific techniques from *NWCG Smoke Management Guide for Prescribed Fire, PMS420-2, February, 2018* that reduce the fuel production include:

- **Site Conversion:** Frequent ground fires in southern pine forests will convert an understory of flammable shrubs (such as palmetto and gallberry) to open woodlands with more grass and herbs, reducing total fuel loading.
- **Chemical Treatments:** Broad spectrum and selective herbicides can be used to reduce live vegetation, or alter species diversity, respectively. This often reduces or eliminates the need for prescribed fire.



4.6 BSMP # 6 – Share the airshed to minimize impacts to the public - Coordination of area burning

DEQ's smoke management program is able to account for all burning in a given area and can be used to make burn decisions. The program relies on burners registering their burns, requesting to burn, or notifying DEQ of their intent to burn, and DEQ providing a daily burn decision for all burners. The program also uses airsheds, counties, and natural geographic boundaries to help coordinate the burning in any given area.

DEQ understands the need for prescribed fire to accomplish land and slash management goals. DEQ utilizes burn restrictions when conditions (e.g., current and forecasted air quality, weather) necessitate limiting emissions from prescribed fire to protect the NAAQS or public health.

In order to coordinate smoke emissions, DEQ broke Idaho into several distinct airsheds and uses these demarcations when making a prescribed fire burn decision. These airsheds can be modified over time when additional information and experience is available to help determine more specific boundaries and related smoke behavior. An airshed is a geographic area that, because of topography, meteorology and/or climate, is frequently affected by the same coherent air mass. Within a single airshed, all burning becomes cumulative and areas share similar amounts of pollutants (e.g., PM), thus increasing the need for burn coordination within that area. For example, a reasonably-sized prescribed burn conducted near Hayden Lake in the Idaho Panhandle Region could limit other nearby burns, but wouldn't limit burning in another area of the region such as near Spirit Lake.

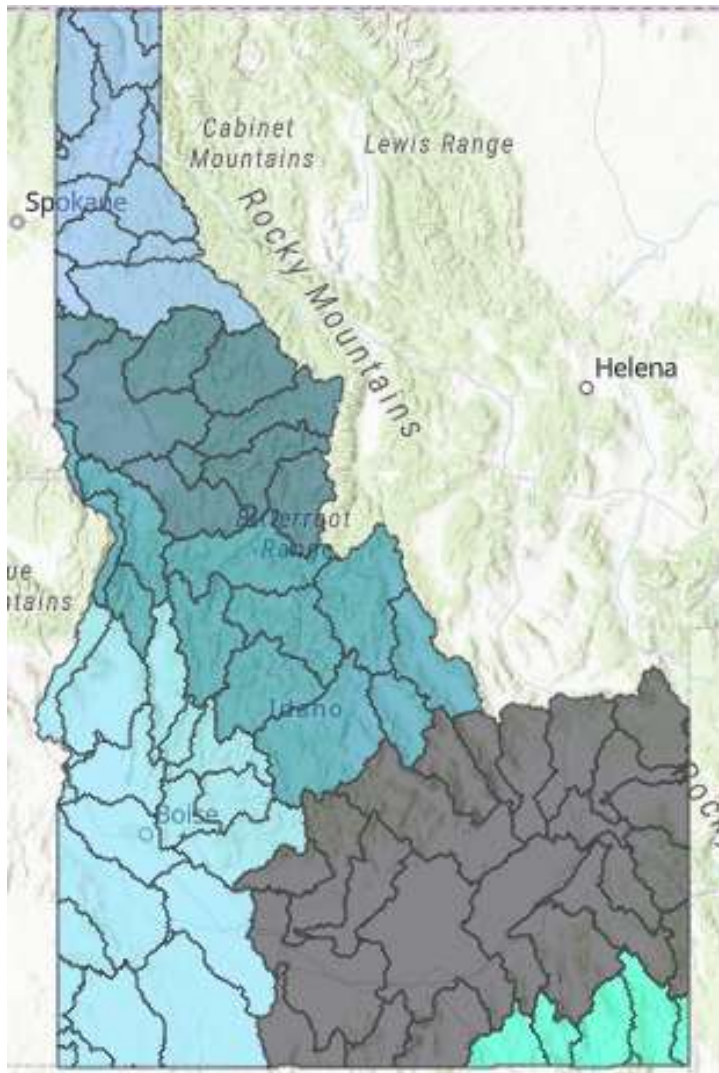


Figure 8 Map of Possible Idaho Airsheds (draft)

Coordination requires some pre-ignition knowledge, accomplished through the registration of planned burning, to ensure proposed burns are mapped and communicating with burners can be accomplished in a timely manner. Location and elevation of burns in relation to surrounding population centers, burns congregating in a common geographical area, fuel conditions, and others are all vital parts of a successful burn coordination plan element.

Authorization to burn includes a process for reviewing weather, fuel, and other conditions which affect smoke generation/behavior and endorsing airshed burning, individual burns, or groups of burns as appropriate. Instructions for conducting burns that consider air quality and the ability of the airshed to disperse emissions could be a factor in many burn decisions. Individual fires or groups based on size, fire objective, short-duration fires, multi-day duration fires, and de-minimis levels are all factors considered when endorsing burning.

A burn approval process is needed to truly have a collaborative process which supports coordination of area burning. This approval process aids timely public notification, ensures land and fire managers achieve resource management objectives, and minimizes public exposure by limiting conditions where too much burning could overwhelm an area. Authorization to burn is a core smoke management plan condition.

5 What Prescribed Fire Type Do I Follow?

The prescribed fire rule was developed in consideration of the amount of burning conducted on a **daily basis**, and the type of burning that is being conducted. Consideration was also given to the procedures and successes of the previously established Montana Idaho Airshed Group and its members.

All burn managers who are not members of a recognized smoke management group should use Table 5 to help plan a project and determine what rule section applies to their burning and which section of this guide to reference. The table was developed to help identify the categories of prescribed fire using multiple options.

Membership of a recognized smoke management group, such as the Montana Idaho Airshed Group, is governed by criteria established by the group's leadership and executive board. Members will not use Table 5.

How to use the Table:







If you are accustomed to using board feet for estimating your project size start at the "Harvest" section, look under the "Board Feet" column, identify where your project falls, and follow the appropriate row across to the far right column marked "Burn Category." This column identifies which category your burn falls within and identifies which section of this guide and the applicable rule for this type of burning.

For example: If you are completing a 28,000 board foot harvest, the project would fall in the second row. Following the second row across leads you to the Minor burn category. Details about the Minor Burning category are found in Section 8 of this field guide.

All pile burning is categorized on a per day basis. If you wanted to burn all the slash from the example above in one day, you would be in the Minor burn category. However, you may choose to burn over multiple days and could be eligible to use the Short Duration Pile Burning category. Section 5.5 explains the ways a burner might use this flexibility. Nothing in the prescribed fire rule prevents someone from conducting a burning in a lower level. Burn categories are based on slash burned per day, not on the total amount of slash that a burner is treating.

Table 5 How to Determine What Type of Burning is Being Conducted.

The “Tons” and “Cubic Feet” columns should be used for rule compliance. The “Board Feet”, “Truckloads” and “# Piles (20x10x10)” columns were included for easy reference only.

<u>Slash</u>			<u>Harvest</u>		<u>Burn Type</u>
					
Tons	Cubic Feet ^a	# Piles (20x10x10) ^a	Board Feet ^b	Truckloads ^c	Burn Project Type ^d
2.5	3,000	3	< 5,000	1	Short Duration (Section 9)
3 - 29	3,001 - 33,999	4 - 33	5,001 - 60,000	2 - 11	Minor (Section 8)
30+	34,000+	34+	> 60,000	12+	Major (Section 7)
Any amount of broadcast burning					Major (Section 7)
<p>a. Calculated using University of Washington's Pile Calculator based on pile size/shape and standard slash attributes</p> <p>b. Calculated using the IDL rule of thumb that 1000 board feet = 1000 pounds of slash</p> <p>c. Calculated using rule of thumb that 5,000 board feet is approximately 1 truckload</p> <p>d. Burn Project is classified by amount of burning <u>PER DAY</u></p>					
<ul style="list-style-type: none"> This table, the field guide, and the air quality prescribed fire smoke management rule are structured based on how much slash is being planned to burn PER DAY. Section 5.5 explains the flexibility available to some burners Cubic feet (ft³) of piles indicates the gross volume of the pile shape, not the net volume of material in the pile. 					

5.1 Recognized Smoke Management Group Member Burning:

If you are a member in good standing of a recognized smoke management group (Section 6), regardless of the volume or type of burning you plan to burn, you are considered a burn manager conducting **Recognized Smoke Management Group Burning**. Most member actions of a recognized smoke management group (e.g., registration, reporting, burn approval processes) will be directed by your group's annual operation guide. Be sure that your group is recognized by DEQ before you rely on your group's procedures for to meet rule requirements.

5.2 Major Burning:

If you conduct any level of broadcast burning or plan to burn more than 34,000 cubic feet (ft³) of slash in a single day, but are not a member of a recognized smoke management group, you are conducting Major Burning for purposes of the rule and this guide.



Figure 10 Major Burning Description

Thirty-four thousand cubic feet (34,000 ft³) of material is roughly equivalent to 30 tons of slash (Table 5). Using the IDL rule of thumb that 1,000 board feet produces 1,000 pounds of slash, 30 tons of slash would be expected from a 60,000 board foot (60MBF) harvest. If a burner built their piles in a half ellipsoid shape (Figure 14) that measured 20 ft. x 10 ft. 10ft., this amount of slash would make approximately 34 piles. Figures 13 and 14 explain the criteria used to estimate these pile assumptions. Persons conducting **Major Burning** will need to follow all rules applicable to their type of burning found in IDAPA 58.01.01.629 and 632. Guidance for achieving compliance with the rule is outlined in Section 7 of this document.

5.3 Minor Burning:

If your project burns more than 3,000 ft³ of piled material but less than 34,000 ft³ in a single day, but are not a member of a recognized smoke management group, you are conducting Minor Burning for purposes of the rule and this guide.

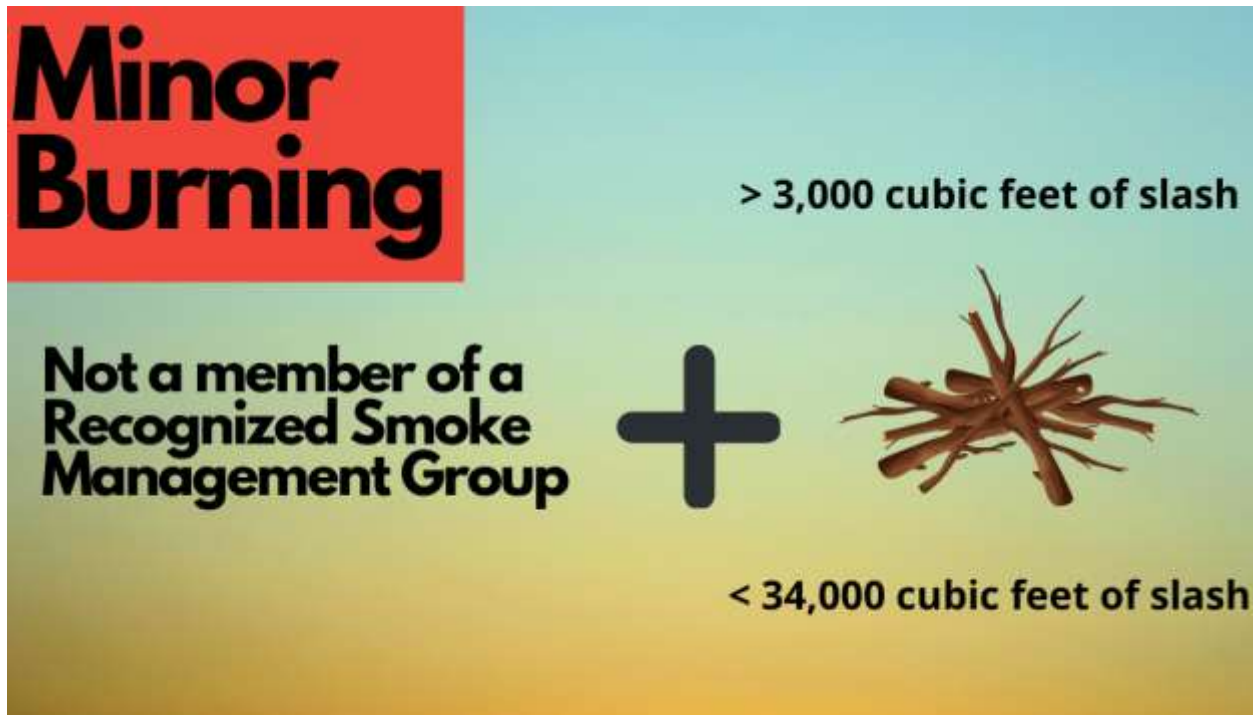


Figure 11 Minor Burning Description

More than 3,000 ft³ but less than 34,000 ft³ of material is roughly equivalent to 3 tons up to 29 tons of slash (Table 5). Using the IDL rule of thumb that 1,000 board feet produces 1,000 pounds of slash, 3 to 29 tons of slash would be expected from more than 5,000 board feet but less than 60,000 board feet (5MBF to 60 MBF). If a burner built their piles in a half ellipsoid shape (Figure 14) that measured 20 ft. x 10 ft. 10ft., this amount of slash would make approximately 4 to 33 piles. Figure 13 and 14 explain the criteria used to estimate these pile assumptions). All persons conducting **Minor Burning** need to follow IDAPA 58.01.01.630 and 632 of the Prescribed Fire Rules. Guidance for achieving compliance with the rule is outlined in Section 8 of this document.

5.4 Short Duration Pile Burning:

If you burn less than 3,000 ft³ of pile material in a single day AND are not a member of a recognized smoke management group you are conducting Short Duration Pile Burning for purposes of the rule and this guide.



Figure 12 Short Duration Burning Description

Three thousand cubic feet (3,000 ft³) of piled material is roughly equivalent to 2.5 tons of slash. Using the IDL rule of thumb that 1,000 board feet produces 1,000 pounds of slash, 2.5 tons of slash would be expected from 5,000 board feet (5MBF). If a burner built their piles in a half ellipsoid shape (Figure 14) that measured 20 ft. x 10 ft. 10ft., this amount of slash would make approximately 3 piles. Figure 13 and 14 explain the criteria used to estimate these pile assumptions.

Short Duration Pile types are commonly called “hand piles” and are predominately made up of brush, severed limbs, poles, tops, and/or other waste material incident to such cutting or to the clearing of land which are 4” and under in diameter, as defined in IDAPA 10.20.04.01.010.15 Rules Pertaining to Forest Fire Protection, piled for burning to reduce the risk of fire spread and accommodate hazard reduction and liability requirements as identified in IDAPA 20.04.02.120.01 Rules Pertaining to the Idaho Forestry Act & Fire Hazard Reduction Laws. Waste material greater than 4” in diameter does not routinely constitute a fire hazard. Having too much large woody debris in your pile may preclude you from using short duration pile burning option especially if smoldering occurs where impacts to neighboring properties are created.



Figure 13 Hand Pile.

Photo courtesy of Roger Ottmar, US Forest Service PNW Research Station, Pacific Wildland Fire Sciences Laboratory.

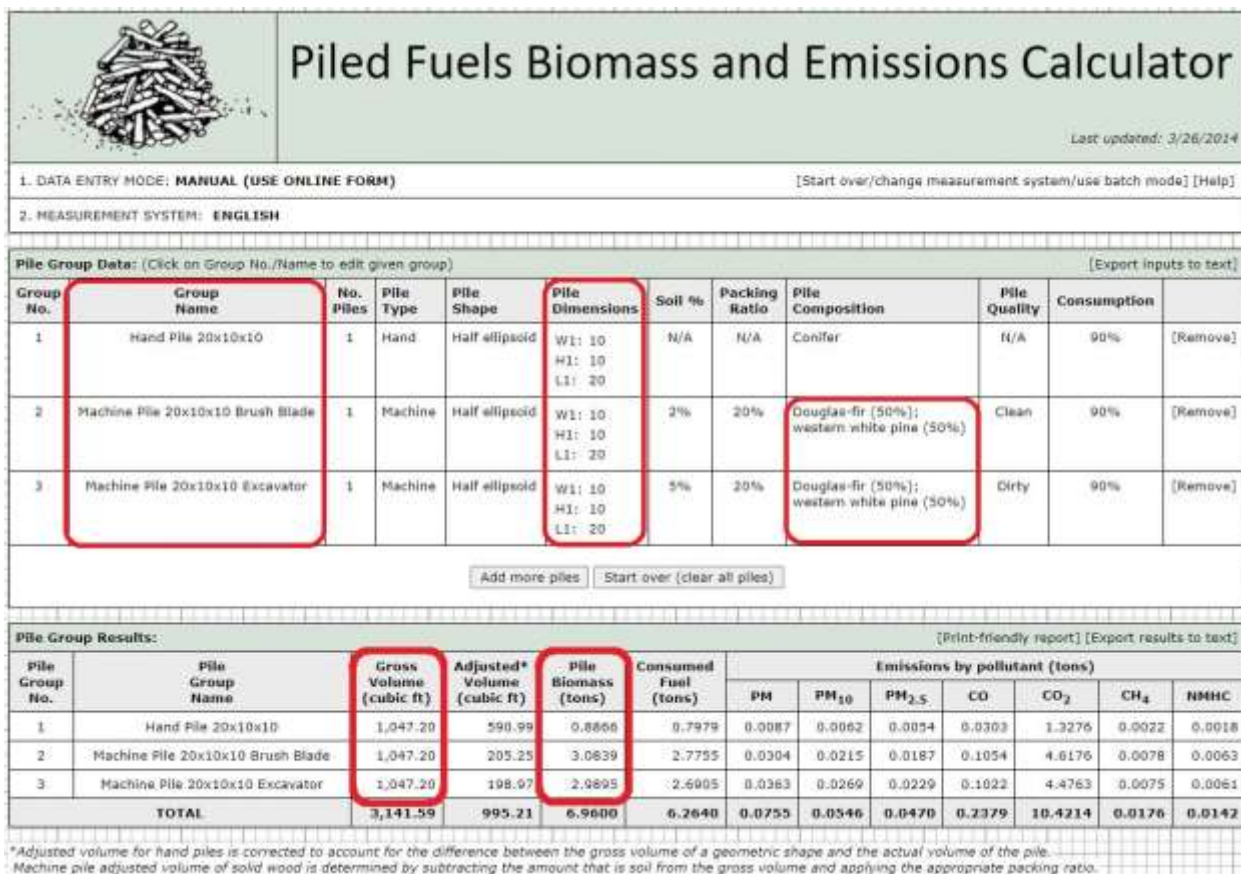
All persons conducting Short Duration Pile Burning need to follow IDAPA 58.01.01.631 and 632 of the Prescribed Fire Rules. Guidance for achieving compliance with the rule is outlined in Section 9 of this document.

5.5 Pile Sizes and Burn Options

All estimates for pile shape and dimensions were made based on several interviews with private forest landowners as well as an online survey of small private forest owners and logging contractors in Idaho. Based on these discussions and survey, DEQ found that the majority of piles in Idaho built by private forest landowners are built at a size of approximately 20 feet by 10 feet by 10 feet in height or smaller in a half ellipsoid shape. Larger industrial prescribed fire users often create much larger piles due to the machinery they use to build the piles and individual harvesting or processing techniques.

Figures 13 and 14 are included to help the user if they utilize pile sizes and construction techniques that differ from the ones used as examples for determining the applicable category for burning. Any pile shape or size can be used but the burner should calculate the tonnage or cubic feet of their project to determine what burning category, and rule section, they will be required to comply with.

Figure 13 shows how DEQ used the University of Washington Pile Calculator <https://depts.washington.edu/nwfire/piles> to determine the amount of material that might be included in piles. Each individual burn project may have piles that are constructed in different shapes and sizes. The total volume being burned in a single day is important to consider when determining your burn category.



Piled Fuels Biomass and Emissions Calculator
Last updated: 3/26/2014

1. DATA ENTRY MODE: **MANUAL (USE ONLINE FORM)** [Start over/change measurement system/use batch mode] [Help]

2. MEASUREMENT SYSTEM: **ENGLISH**

Pile Group Data: (Click on Group No./Name to edit given group) [Export inputs to text]

Group No.	Group Name	No. Piles	Pile Type	Pile Shape	Pile Dimensions	Soil %	Packing Ratio	Pile Composition	Pile Quality	Consumption	
1	Hand Pile 20x10x10	1	Hand	Half ellipsoid	W1: 10 H1: 10 L1: 20	N/A	N/A	Conifer	N/A	90%	[Remove]
2	Machine Pile 20x10x10 Brush Blade	1	Machine	Half ellipsoid	W1: 10 H1: 10 L1: 20	2%	20%	Douglas-fir (50%); western white pine (50%)	Clean	90%	[Remove]
3	Machine Pile 20x10x10 Excavator	1	Machine	Half ellipsoid	W1: 10 H1: 10 L1: 20	5%	20%	Douglas-fir (50%); western white pine (50%)	Dirty	90%	[Remove]

[Add more piles] [Start over (clear all piles)]

Pile Group Results: [Print-friendly report] [Export results to text]

Pile Group No.	Pile Group Name	Gross Volume (cubic ft)	Adjusted* Volume (cubic ft)	Pile Biomass (tons)	Consumed Fuel (tons)	Emissions by pollutant (tons)						
						PM	PM ₁₀	PM _{2.5}	CO	CO ₂	CH ₄	NMHC
1	Hand Pile 20x10x10	1,047.20	590.99	0.8866	0.7979	0.0087	0.0062	0.0054	0.0303	1.3276	0.0022	0.0018
2	Machine Pile 20x10x10 Brush Blade	1,047.20	205.25	3.0839	2.7755	0.0304	0.0215	0.0187	0.1054	4.6176	0.0078	0.0063
3	Machine Pile 20x10x10 Excavator	1,047.20	198.07	2.9895	2.6905	0.0363	0.0269	0.0229	0.1022	4.4763	0.0075	0.0061
TOTAL		3,141.59	995.21	6.9600	6.2640	0.0755	0.0546	0.0470	0.2379	10.4214	0.0176	0.0142

*Adjusted volume for hand piles is corrected to account for the difference between the gross volume of a geometric shape and the actual volume of the pile.
Machine pile adjusted volume of solid wood is determined by subtracting the amount that is soil from the gross volume and applying the appropriate packing ratio.

Figure 14 University of Washington Pile Calculator. Hand pile and machine pile construction.

Source: <https://depts.washington.edu/nwfire/piles/>

When considering estimating the mass of the material being burned it is much easier to calculate the gross volume in cubic feet of a pile. This requires consideration of the piles shape and size. Figure 14 depicts several pile shapes and the necessary width and height measurements needed to calculate volume. The University of Washington Pile calculator <https://depts.washington.edu/nwfire/piles/> can help burners with this calculation and provide immediate conversion to mass in tons. The size of the fuel being piled must also be considered. Although there are no restrictions for size of material being burned using prescribed fire, an excess of material greater than 4" in diameter in any given pile may exclude the burner from being considered a Short Duration Pile burn type if smoldering is likely to occur and the pile is not expected to burn out within 24 hours.

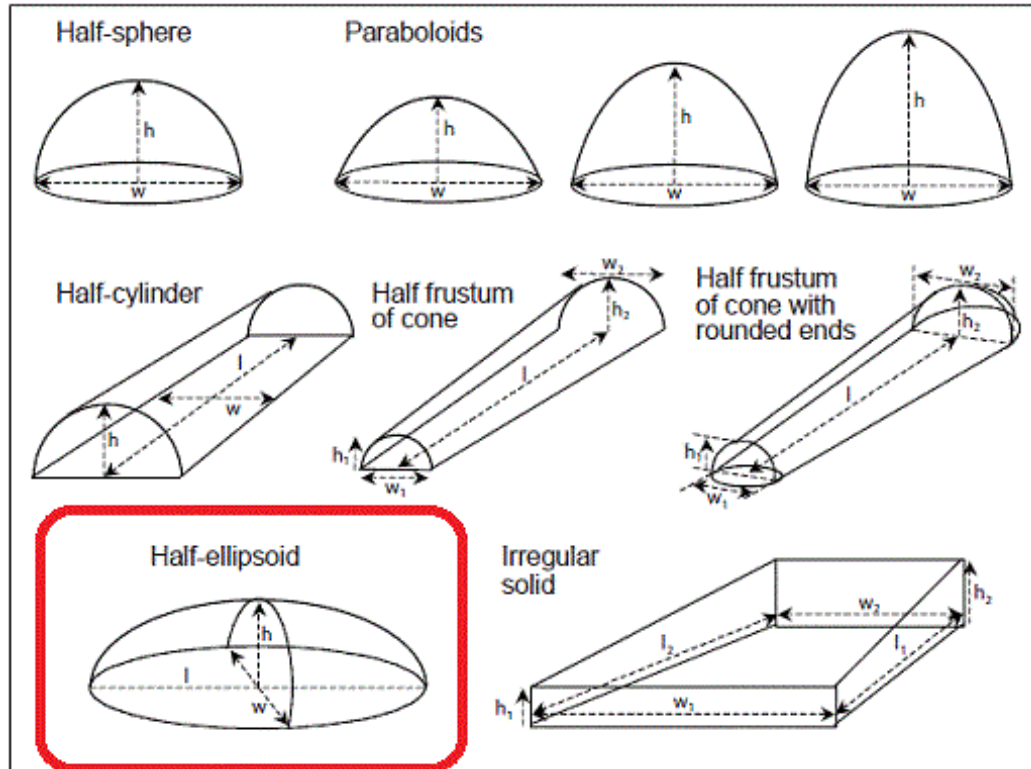


Figure 15 Measuring and Building Piles.

Burners may use whatever pile shape best fits their objectives. DEQ used a “half-ellipsoid” shape to determine cubic feet in a pile. If the burner uses a different shape, they will need to use the University of Washington Pile calculator (<https://depts.washington.edu/nwfire/piles>) to determine the volume of their piles.

Burners may choose to burn fewer piles in a single day and instead burn the piles over multiple days in order to reduce the smoke impacts as well as their regulatory requirements for burn request and notification. Burning under the Short Duration Pile Burning category relieves burners of the requirement to request approval for burning and to notify DEQ of the intent to burn. DEQ’s criteria for excluding burn notification for Short Duration Pile Burning less than or equal to 3,000 ft³ or 2.5 tons of piled material in a single day is based on the understanding that burning this amount has little impact on air quality when adequate ventilation is available to disperse the pollutants. Burning more than this amount or broadcast burning requires burners to either make a request to burn or to notify DEQ of the intent to burn.

Figure 15 depicts options any burner who is not a member of a smoke management group may choose to accomplish their prescribed fire.

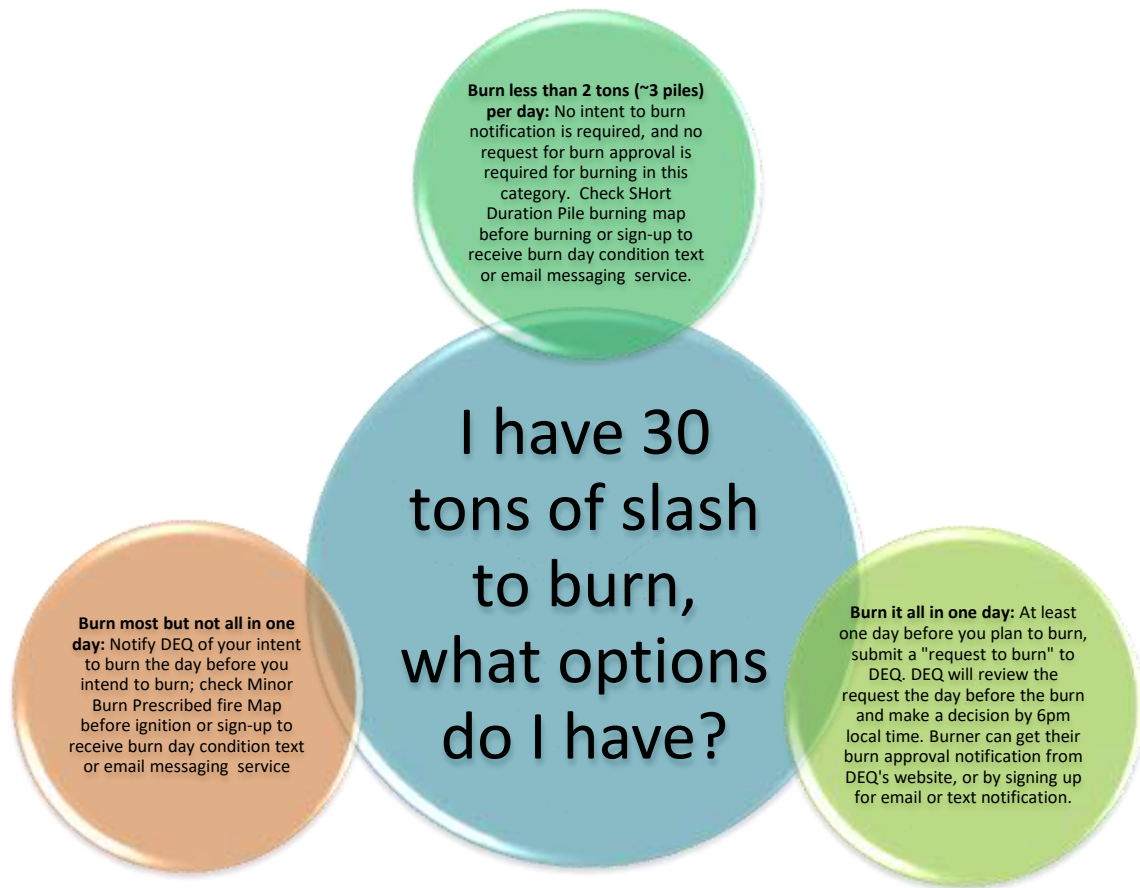


Figure 16 Burn Day Flexibility.

Assuming the burner has completed their registration requirements at least 30 days prior to a planned burn, they can simplify their regulatory burden by burning less in a single day.

6 Recognized Smoke Management Group



Rule Review

628. Recognized Smoke Management Group Burning.

Recognized smoke management group burning is any use of prescribed fire to burn slash and natural fuels by any person, as defined in Section 006, that is a member in good standing of a recognized smoke management group.

The Prescribed Fire rule allows burners the option to join a Recognized Smoke Management Group to fulfill rule requirements.

The benefits to burners to joining a smoke management group include:

- Help burners to meet regulatory requirements,
- Collaborate with other burners to discover improved smoke management techniques,
- Advocacy for burn decision on a daily basis,
- Additional meteorological and smoke forecast support,
- Access to training
- Facilitated annual coordination meeting

Recognized smoke management groups work collaboratively with burners, regulators, and support organizations to use the principles of smoke management to minimize smoke impacts on public health while also accomplishing land management objectives.

A smoke management group helps burners choose good dispersion days for burning, provide training, coordinate area burning, collaborate with regulatory agencies, and communicate with the public.

Becoming a “recognized” smoke management group in Idaho provides a way for burners to meet the requirements of DEQ’s Prescribed Fire rules. Recognized smoke management groups have proven to DEQ that they meet or exceed DEQ’s Prescribed Fire rules.

A burner is deemed to be a member in good standing with a recognized smoke management group so long as the burner complies with the applicable policies and procedures of the Recognized Smoke Management Group.

At the date of this publication, the Montana Idaho Airshed Group is the only smoke management group in Idaho which could be a recognized group. If you are not sure if your group qualifies as a recognized group, check with the DEQ Program Office or reference IDEQs homepage at www.deq.idaho.gov.

6.1 Certification of Smoke Management Group

Any group who desires to become a Recognized Smoke Management Group must annually demonstrate to DEQ how its policies and procedures meet or exceed the requirements identified in IDAPA 58.01.01.628, 632.02, and 632.03. To be a Recognized Smoke Management Group, the group's policies and procedures must include the following:



Rule Review

628.01. Certification of Recognized Smoke Management Group.

To become a recognized smoke management group, the group must annually demonstrate to the Department, through a current operating guide, that their policies and operating procedures meet or exceed the requirements identified in Sections 628, and 632.02 – 632.03

The first year that a group requests recognition, they must submit the smoke management group's operating guide, along with a written request to be recognized for the following year, and any needed agreements, to DEQ for review and approve for recognition. In subsequent years, the group must annually submit an affidavit, letter of commitment, or other written statement that the group's operating guides and MOAs have not been changed and still meet the prescribed fire rules (IDAPA 58.01.01.628) along with a written request to be recognized for the following year. If there have been changes to the group's operating guide so that it no longer meets all the prescribed fire requirements, the group will need to meet with DEQ to discuss the changes and how they expect burners to comply with the rules.

The Department will notify the Group and post on The Department's website a list of Recognized Smoke Management Groups and the rule section(s) that are satisfied by the group's policies and procedures and any limitations (IDAPA 58.01.01.629.01.a.). Notification will be completed annually



Rule Review

628.01.a. Notification.

The Department will notify the group and post on the Department's website a list of recognized smoke management groups, the rule section(s) satisfied by the group's policies and operating procedures, and any limitations.

DEQ and a representative of the Group will work together to determine the burn decision each day that burning is proposed.



Rule Review

628.01.b. Collaboration.

To satisfy Subsection 628.02.d and 632.02, the final burn decision for members of the recognized smoke management group will be determined through collaboration with the recognized smoke management group representative and the Department.

6.2 Smoke Management Planning



Annual coordination with DEQ.

Currently, the Montana Idaho Airshed Group, of which DEQ is a member of the Executive Board, conducts two annual meetings (North Idaho and South Idaho) to discuss burning activity, report annual accomplishments, and identify any changes to the program. These annual meetings could possibly be leveraged to include time for most burners to discuss their projects with DEQ and would accomplish the annual coordination requirement for many of the member burners.



Rule Review

628.02.a. Annual Coordination

On an annual basis, shall provide a representative to discuss projected burn projects with the Department;



Registration of planned burns.

Group members would register their projects with the group (not DEQ). The Group would allow DEQ to access these burn project registrations or otherwise provide them to DEQ.



Rule Review

628.02.b. Registration

Prior to conducting any prescribed fire, register any planned burns in accordance with the recognized smoke management group's current operating guide;



Request to burn.

Each day that they want to burn, members would propose their burn to the Group's burn management system for approval. DEQ would access this system to see all the requests for approval.



Rule Review

628.02.c. Request to Burn.

Submit a request to burn to the group's burn management system in accordance with the group's current annual operating guide;



Burn approval.

A Recognized Smoke Management Group's procedures must include the coordination of daily burn approval determination with the Department to complete final burn decisions (IDAPA 58.01.01.628.01.c 628.05, and 632).

DEQ and the Group's smoke management coordinator work together to determine the final burn decision for the Group's members each burn day. Member burners would be notified of their burn's approval or restriction by the Group.



Rule Review

628.02.d. Burn Decision

Prior to conducting a burn, the burn managers will have received notification of the final burn decision, burn approval, and any specific conditions under which burning is allowed through their group notification process in accordance with its current annual operating guide.

There may be times that a recognized smoke management group is not in full operational status, such as having the online system set to auto-approve burn requests. During these times, group members would need to register their burns and request burn approval through the Department **unless specific processes that address request and approval requirements of 628.01.b. are included in the group's operating guide.** In the event that a smoke management group operating guide does not sufficiently address the collaborative registration, request and decision process when not in full operational status members would need to use the process that persons conducting major burning use (see Section 7 for a more detailed description). These steps include:

- Annual coordination with DEQ if not completed during Group's operation period
- Register burning projects with DEQ at least 30 days prior to planned ignition
- Request burn approval at least 1 business day prior to planned ignition.
- Verify approval prior to ignition
- Obtain and review a smoke dispersion forecast prior to planned ignition.
- Keep records of the burn and provide them to DEQ upon request.

6.3 Smoke Management Practices



Smoke dispersion forecast

Before ignition, the burn manager shall obtain and review a smoke dispersion forecast specific to the location and time of ignition. The forecast needs to include smoke dispersion information such as mixing height, transport and surface wind speed and direction, and ventilation. If the burner is not able to get a Spot Weather Forecast from the National Weather Service, Appendix H outlines how burners can use the point and click option from NWS to meet this section requirement.

The burn manager needs to evaluate whether the smoke dispersion forecast supports conducting the burn. Other tools that meet or exceed this requirement are acceptable.



Rule Review

628.03.a. Smoke Dispersion Forecast.

On the morning of the burn, obtain and review a smoke dispersion forecast specific to the burn location and ignition time that includes smoke dispersion conditions such as transport and surface wind speed and direction, mixing height, and ventilation. The burn manager will evaluate whether the forecasted weather conditions will support conducting the burn;



On-site confirmation of weather conditions

Forecasts and actual weather conditions do not always match. Burn managers must confirm that wind and other atmospheric conditions match the smoke dispersion forecast and will still support adequate smoke ventilation in accordance with smoke management group's operating guide before ignition. If they will not, the burn should be reconsidered and adjustments to ignition made.

Wind direction can directly impact smoke sensitive areas by pushing smoke into those areas. The burn manager must be certain that the wind direction and speed will avoid impacting Smoke Sensitive Areas and Institutions with Sensitive Population locations. If it is not possible to avoid impacting SSAs and ISPs, the burn should be reconsidered and make adjustments to the ignition plan



Rule Review

628.03.b. Weather Observations and Wind Direction.

Prior to ignition at the project location, confirm that the wind direction and other atmospheric conditions such as humidity are consistent with the smoke dispersion forecast, will support adequate smoke ventilation in accordance with the smoke management group's annual operating guide requirements, and will avoid impacting smoke sensitive areas and locations with institutions with sensitive populations;



Confirmation of fuel conditions

Wet fuel will not combust adequately and much of the burning will occur during the smoldering phase, producing more smoke than if the fuel had been dry. Prior to ignition at the project location, the burn manager shall confirm fuel conditions will support adequate combustion to lessen the amount of smoke produced.



Rule Review

628.03.c. Fuel Conditions.

Prior to ignition at the project location, confirm fuel conditions will support adequate combustion;



Test burn

Conducting a test burn allows the burn manager to determine if the current weather conditions, wind speed and direction, and fuel conditions will provide adequate smoke dispersion. The burn manager must be sure that there will be adequate vertical and horizontal smoke dispersion and that the fuel conditions will allow for good fuel consumption in the flaming phase. If a test burn does not show that conditions are good, the burn manager should not continue with the burn.



Rule Review

628.03.d. Test Burn.

If conducting broadcast burning or burning multiple piles, conduct a test burn to confirm adequate vertical and horizontal smoke dispersion and adequate fuel burning rate that promotes consumption of fuel by flaming phase or meets specific prescription needed for successful treatment;



Recordkeeping and reporting

Recordkeeping is an important tool for burn managers and burn decisions. Recording details about the burn: forecast and actual weather conditions, fuel conditions, smoke dispersion, smoke impacts, time of day that burning occurred, and general observations of smoke behavior can help inform future decisions. There will be times that all signs pointed to it being a good day for burning but an unexpected weather change caused a smoke impact. Having a record of this kind of situation will help the burner and DEQ learn about ideal burning conditions in their area and better inform their future practices and burn decisions.

In addition, one of the important benefits of a smoke management program is the ability to use the Exceptional Events (EE) policy if there is a NAAQS exceedance. This process can be long and requires lots of documentation. There may be times that there was an unexpected smoke impact and DEQ needs the records of a burn to use for the EE process. In those cases, DEQ will reach out to the burner to get their report from the day of the burn. Burners will need to keep all their records for at least 120 days for this possible need.

After-action reviews are also an effective tool for investigating undesirable or unexplained smoke impacts. The Department may request an after-action review if warranted.



Rule Review

628.03.e. Recordkeeping and Reporting.

i. Burn managers must:

- (1) Report the completed burn activity in accordance with the recognized smoke management group's current operating guide;
- (2) Record on-site weather conditions during the day of ignition. Records will include observations before, during, and after the ignition and the time of day the observations were made;
- (3) Record smoke conditions observed during and after the burn and any known smoke impacts on any smoke sensitive area and institution with sensitive populations as a result of the burn; and
- (4) Record the condition of the fuels being burned and the results of any test burn if conducted.

ii. The member of a recognized smoke management group must retain and provide to the Department upon request all records created in accordance with Subsections 628.03.e.i.2-4. for a minimum of one hundred twenty (120) days from the completion of the burn.

7 Major Burning



Rule Review

629. Major Burning

Major burning is any use of prescribed fire to burn slash by any person in quantity greater than thirty-four thousand (34,000) cubic feet of material, or thirty (30) tons slash material per day, or any amount of broadcast type burning of natural or activity fuels.

To help burners understand how to comply with the rule, DEQ has developed a “timeline” to detail when burners will need to complete various steps.



Figure 17 Timeline for Accomplishing Major Burning

7.1 Annual Coordination

Coordinating burns is a key part of any smoke management program. In order for DEQ to make a timely burn decision each day, there may be times they will need to have a coordination call with someone who plans to conduct Major Burning.

Reviewing burns that are expected to produce a significant amount of smoke or are located in an area of complex meteorological conditions prior to the burn allows DEQ to develop a plan for approving these burns when there is adequate smoke dispersion. Knowing the capabilities of the burner and having confidence in their on-the-ground decisions can provide flexibility to DEQ when making the daily burn decision. In addition, these meetings can provide the burner with the types of weather conditions that would be favorable for smoke dispersion. This information will help the burner choose an appropriate day for proposing their burn and manage their expectations for when they can expect to be approved.



Rule Review

629.01. Annual Coordination

On an annual basis, all persons conducting major burning must provide a representative, preferably the burn manager of the project, to discuss projected burn projects with the Department.

7.2 Registration

Persons who intend to conduct Major Burning must register their projects with DEQ at least 30 days prior to the planned ignition. Burners can use the web-based data portal or mail in a hard copy of their registration. Modifications to burn project registrations can be made at any time prior to submitting a request to burn. DEQ is available to assist Burners who do not have internet access or are having trouble navigating the online registration process. DEQ may be able to process the registration before the 30 day window. Burners may make a request to burn as soon as their registration has been processed.

For each burn project, the burner needs to include the following information:

- Burn manager name and contact information including phone number and email
- Project name or unique project identifier can be any name that is unique to the project. For example, if the burner has several projects in the same area, name them with the burner's name, project location, and a number – Johnson-Lowman 1, Johnson-Lowman 2, etc.
- Burn type (broadcast or pile burning)
- Burn location (elevation, lat/long, address)
- Land owner name

- Project details including: acreage to be burned for broadcast burns, size and number of piles, and method of construction for pile burns (such as hand pile, dozer, or grapppler)
- Fuel characteristics expected such as estimated fuel loading, and moisture content.



Rule Review

629.02. Registration

Prior to conducting any prescribed fire all burn managers who will be conducting major burning, must register any planned burns in accordance with the following:

a. No later than thirty (30) days before the first anticipated ignition date of the year, all persons conducting major burning must submit a registration to burn using forms provided by the Department. Forms will be submitted through the Department's web-based data portal, by mail service, fax, or hand delivered to the Department. The registration will include the following information for each burn project:

- i. Burn manager name and contact information including phone number and email address;
- ii. Project name or unique project identifier;
- iii. Burn type;
- iv. Burn location;
- v. Land owner name;
- vi. Project details including: acreage to be burned for broadcast burns, size and number of piles, and method of construction for pile burns (such as hand pile, dozer, or grapppler); and
- vii. Fuel characteristics expected such as estimated fuel loading and moisture content.

b. Modifications to burn project registrations can be made at any time prior to submitting a request to burn as applicable in Subsection 629.03.

7.3 Request to Burn

Before burning, persons conducting Major Burning will have to submit a request to burn to DEQ. DEQ will analyze air quality and forecast weather before making a decision (See Section 10.2 and Appendix I for more details on how DEQ makes a burn decision). DEQ must receive the request by noon local time at least one business day prior to proposed ignition by noon local time. For example, if you plan to burn on Monday, you will need to submit a request by the preceding Friday. If you plan to burn on a Tuesday, following a Monday holiday, you will need to submit the request by the preceding Friday. If you plan to burn on a Wednesday (not a holiday or after a holiday), you will need to submit a request by Tuesday at noon local time.



Note

Request Burn Approval By:

- Calling DEQ
- Texting the DEQ Burn Approval Email
- Use the online data portal to request approval for your burn.

*See **Appendix B** for detailed instructions on how to request approval for you burn.*

When making your request, reference the unique project identifier used in the registration. This is the time to make any updates to the information provided at registration. Changes might include:

- Updates to the burn plan
- Change in burn manager
- Fuel loading or acreage
- IDL hazard abatement deadlines
- Any other information you believe may be helpful to DEQ when they make the burn decision, such as timing of ignition or duration of burn.



Rule Review

629.03. Request to Burn

- a. On forms provided by the Department, submit a request to burn to the Department by noon local time one (1) business day before proposed ignition. For weekend or holiday burning, the request to burn must be received by the Department by noon local time the last business day of the week (i.e., Sunday and Monday burning will need to be requested Friday by noon); and
- b. Provide any updates to the burn plan or burn manager's name if changed since initial registration. Reference the burn's unique identifier established in the registration process completed in Subsection 629.02. Update any details of the burn such as fuel loading and acreage when submitting request to burn, if known at the time, and if the burner believes the updated information will be relevant to smoke management and air quality considerations. Relevant information may include pile sizes and quantity, estimated moisture content of fuel, timing of ignition, duration of burn, and others.

7.4 Burn Decision

Burners may not burn unless their burn project has been approved for the day. Burn managers will be notified of the burn decision and their individual burn approval by checking the DEQ website. The burn decision may include information about specific conditions under which burning may occur. For example, the decision may state that "all burns must be completed by 3pm today because the mixing height will drop by 4pm and cause dispersion and ventilation to diminish and may cause impacts on ISPs and smoke sensitive areas."

Burn decisions will be post by 5pm each business for the following day. For weekends and holidays, the burn decision will be posted by 5 pm the last business day prior to the weekend or holiday.

When it is available, burners may sign up to receive their burn decision by text or email service.

Additionally, fire safety considerations may be applicable to the burn and must be considered by the burn manager. Burn manager should check with the local fire protection district prior to conducting



Note

Sample Burn Decision Language:

Good Dispersion Day:

"All major burning is allowed today. Before ignition, confirm wind direction will not impact smoke sensitive areas. Confirm atmospheric conditions and fuel conditions support adequate combustion and dispersion of smoke."

Marginal Dispersion Day:

"Dispersion is marginal today. Confirm atmospheric conditions and wind direction on site before ignition. If smoke is not lifting and dispersing, as expected during the test burn phase, cease ignitions and wait for another day. If smoke is lifting and dispersing, continue to monitor conditions during the burn and adjust plan if atmospheric conditions change. No ignitions after 3pm so that smoke has time to lift and leave the area before the nighttime inversion traps smoke in the valley."

open burning of any kind. Local ordinances which limit open burning may be in place. Burn managers are responsible to comply with local and state fire safety regulations at all times independent of smoke management decision.



Rule Review

629.04. Burn Decision

Burn managers will be notified of the daily burn decision and burn approval by the Department via its website. The Department will post the daily burn decision, any burn restrictions or specific conditions under which burning is limited, and any burn projects that have been approved by 5pm local time each business day for the following day. Burn decisions and burn approvals for weekend and holidays will be posted by 5pm local time the last business day prior to the weekend or holiday.

7.5 Smoke Management Practices

Although fire practitioners should always consider following all appropriate Basic Smoke Management Practices on every burn, there are a few critical practices that Major Burners must use to comply with prescribed fire rules in Idaho. Section 4 outlines the comprehensive smoke management practices that should be considered when conducting any prescribed burn.

Before, during, and after a prescribed fire, Major Burner burn managers will utilize the following practices:



Obtain a smoke dispersion forecast that is specific to the burn location and ignition time.



Evaluate whether smoke dispersion conditions still support conducting the burn.



Record onsite weather conditions. Confirm that weather conditions and wind direction will not directly impact ISPs.



Evaluate fuel conditions to be sure they will support good combustion during the flaming phase and will not smolder for long periods.



Conduct a test burn and confirm adequate dispersion.



Report burn completion data to DEQ.



Retain records for 120 days post burn and provide them to DEQ upon request.



Rule Review

629.05. **Smoke Management Practices.** Burn managers must:

- a. **Smoke Dispersion Forecast.** On the morning of the burn, obtain and review a smoke dispersion forecast specific to the burn location and ignition time that includes smoke dispersion conditions such as transport and surface wind speed and direction, mixing height, and ventilation. The burn manager will evaluate whether the forecasted weather conditions will support conducting the burn;
- b. **Weather Observations and Wind Direction.** Prior to ignition at the project location, confirm that the wind direction and other atmospheric conditions such as humidity are consistent with the smoke dispersion forecast, will support adequate smoke ventilation, and will avoid impacting smoke sensitive areas and locations with institutions with sensitive populations as defined in Section 006;
- c. **Fuel Conditions.** Prior to ignition at the project location, confirm fuel conditions will support thorough combustion;
- d. **Test Burn.** If conducting broadcast burning or burning multiple piles, conduct a test burn to confirm adequate vertical and horizontal smoke dispersion and adequate fuel burning rate that promotes consumption of fuel by flaming phase or meets specific prescription needed for successful treatment; and
- e. **Recordkeeping and Reporting.**
 - i. Burn managers must:
 - (1) Using forms provided by the Department, report to the Department total acres burned by noon local time the first business day after the burn project was approved to burn;
 - (2) Record on-site weather conditions during the day of ignition. Records will include observations before, during, and after the ignition and the time of day the observations were made;
 - (3) Record smoke conditions observed during and after the burn and any known smoke impacts on any smoke sensitive area and institution with sensitive populations as a result of the burn. Burn managers may consider recording if no impacts occur; and
 - (4) Record the condition of the fuels being burned and the results of any test burn if conducted.
 - ii. Persons conducting major burning must retain and provide to the Department upon request all records created in accordance with Subsections 629.05.e.i.2-4. for a minimum of one hundred twenty (120) days from the completion of the burn.

8 Minor Burning



Rule Review

630. Minor Burning

Minor Burning is any use of prescribed fire to burn piled slash or woody debris by any person in quantities greater than three thousand (3,000) cubic feet of slash material, or two point five (2.5) tons of slash material per day and less than thirty four thousand (34,000) cubic feet slash material, or thirty (30) tons slash material per day.

To help burners understand how to comply with the rule, DEQ has developed a “timeline” to detail when burners will need to complete various steps.



Figure 18 Timeline for Accomplishing Minor Burning

8.1 Registration

Persons who intend to conduct Minor Burning must register their projects by submitting a Forest Practice Act Notification or Certification of Compliance Form with the Idaho Department of Lands at least 30 days before they plan to burn. The Department of Environmental Quality will receive the information from this submittal and process as the registration. DEQ may be able to process the registration before the 30 day period. Burners may submit a notification of intent to burn as soon as their registration has been processed.

If a burner does not submit the forms to IDL, they can submit a registration to DEQ instead. See Appendix B for a copy of the registration form. For each burn project registration, the burner needs to include the following information:

- Burn manager name and contact information including phone number and email
- Project name or unique project identifier – can be any name that is unique to the project. For example, if the burner has several projects in the same area, name them with the burner's name, project location, and a number – Johnson-Lowman 1, Johnson-Lowman 2, etc.
- Burn location (elevation, lat/long, address)
- Land owner name
- Project details including: size and number of piles, and method of construction for piles (such as hand pile, dozer, or grappler)
- Fuel characteristics expected such as moisture content.

There may be times that DEQ may need to request additional information from the burner if it is determined that the information is needed to ensure the burn will not cause or contribute to a violation of the NAAQS, adversely impact a smoke sensitive area or institution with sensitive populations. If DEQ determines this information is needed, they will contact the burn manager, or designee, within 14 days of receipt of a registration.



Rule Review

630.01. Registration

- a. Prior to conducting any prescribed fire, all burn managers who will be conducting minor burning must register each planned burn project in accordance with Subsections 630.01.a.i. or ii.
 - i. Register each burn project by submitting the Forest Practice Act Notification or Certification of Compliance Form with the Idaho Department of Lands. The Department of Environmental Quality will receive the information from this submittal and process as the registration or;
 - ii. No later than thirty (30) days before the anticipated ignition date, submit the following information to the Department using the forms provided by the Department:
 - (a) Burn manager name and contact information including phone number and email address;
 - (b) Project name or unique project identifier;
 - (c) Burn location;
 - (d) Land owner name;
 - (e) Project details including: size and number of piles, and method of pile construction (such as hand pile, dozer, or grappler); and
 - (f) Fuel characteristics expected such as moisture content.
- b. The Department may request additional information such as planned time of ignition and expected burn duration from the burn manager within fourteen (14) days of receipt of a registration if the Department determines that the information is needed to ensure that the burn approval will not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) or adversely impact a smoke sensitive area or institution with sensitive populations.

8.2 Notification of Intent to Burn

Burn manager, or designee, shall submit a notice of intent to burn to the Department, using forms provided by the Department, by noon local time at least one (1) business day prior, but no more than ten (10) business days prior to anticipated burn date. For Monday, weekend or holiday burning the notice of intent to burn must be received by the Department by noon local time the last business day of the week prior.

If the burner believes they have relevant information that may influence the burn decision, they may submit that with their Notice of Intent to Burn. The Notice of Intent to Burn must reference

the unique project identifier and any of the following information that the burner wishes to include:

- Piles size and quantity (if changed since registration)
- Estimated moisture content of fuel (if changed since registration)
- Estimated time of ignition
- Duration of burn
- Idaho Department of Lands hazard fuel abatement deadlines

DEQ will acknowledge receipt of intent to burn notification. DEQ will consider the intent to burn notification active for 10 days or unless the burner notifies DEQ that the burn is done, whichever comes first. If the burner is unable to complete their burn during that ten day period, they will need to submit a new intent to burn notification if they plan to try to burn on another date.



Rule Review

630.02. Notice of Intent to Burn

Burn managers must submit a notice of intent to burn to the Department, using forms provided by the Department, by noon local time a minimum of one (1) business day prior, but no more than ten (10) business days prior to anticipated burn date. For weekend or holiday submissions, the notice of intent to burn must be received by the Department by noon local time the last business day of the week.

a. Burn managers may submit additional information deemed relevant to the burn decision to the Department. The Department will include this information when making the burn decision. Additional information may include but is not limited to:

- i. Pile sizes and quantity;
- ii. Estimated moisture content of fuel;
- iii. Estimated time of ignition;
- iv. Duration of burn; and
- v. Idaho Department of Lands hazard fuel abatement deadlines.

b. The Department will acknowledge receipt of intent to burn notification.

c. The Department will issue a burn decision for each notice of intent to burn for each day until the burn is reported as complete or for ten (10) days, whichever comes first.

8.3 Burn Decision

DEQ will post the daily burn decision by 5pm each business day for the following day. For Mondays, weekends and holidays, the burn decision will be posted by 5 pm the last business day prior to the weekend or holiday.

Burn managers will check the DEQ website to be sure that burning is not prohibited the day they plan to burn. The burn decision may include information about specific conditions under which burning may occur.

When it is available, burners may sign up to receive their burn decision by text or email service.

Additionally, fire safety considerations may be applicable to the burn and must be considered by the burn manager. Burn manager should check with the local fire protection district prior to conducting open burning of any kind. Local ordinances which limit open burning may be in place. Burn managers are responsible to comply with local and state fire safety regulations at all times independent of smoke management decisions.



Note

Sample Burn Decision Language:

Good Dispersion Day:

“All minor burning is allowed today. Before ignition, confirm wind direction will not impact smoke sensitive areas. Burns must be completed by 5pm local time.”

Marginal Dispersion Day:

“Dispersion is marginal today. All burns must be completed by 3pm today because the mixing height will drop by 4pm and cause dispersion and ventilation to diminish and may cause impacts on ISPs and smoke sensitive areas.”

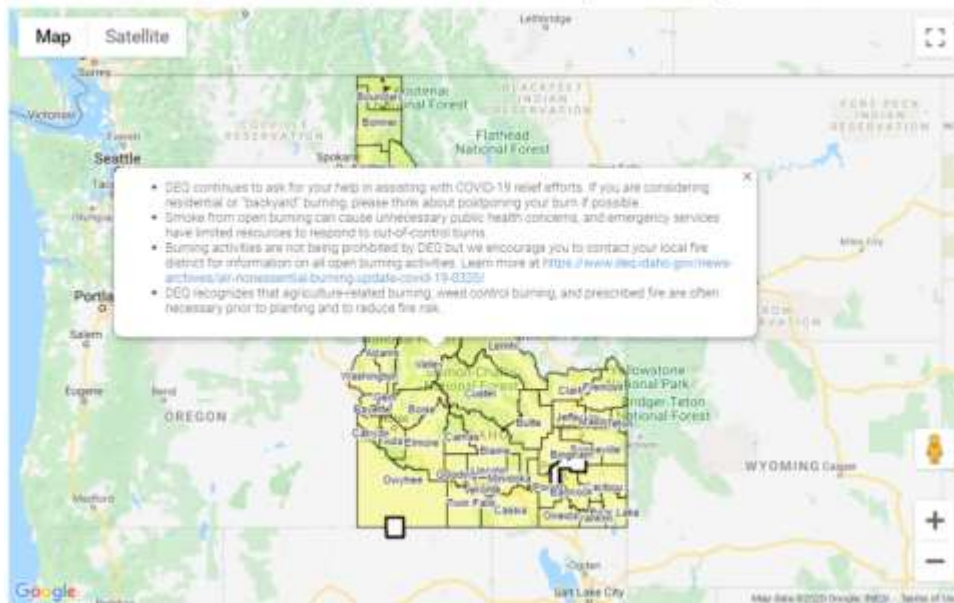


Figure 19 Minor Prescribed Burning Map Example



Rule Review

630.03. Burn Decision

The Department will post on its website the daily burn decision, and any burn restrictions or specific conditions under which minor burning is limited by 5pm local time each business day for the following day. Burn decisions for weekend and holidays will be posted by 5pm local time the last business day prior to the weekend or holiday.

8.4 Smoke Management Practices

Although fire practitioners should always consider following appropriate Basic Smoke Management Practices on every burn, there are a few critical practices that persons conducting Minor Burning must use to comply with prescribed fire rules in Idaho. Section 4 outlines the comprehensive smoke management practices that should be considered when conducting any prescribed burn.

Before, during, and after a prescribed fire, Minor Burning burn managers must utilize the following practices:



Ensure that DEQ received intent to burn notification and that the ignition is occurring during the 10 day period. Confirm burning is not prohibited on morning of ignition.



Confirm that wind direction and speed will not impact smoke sensitive areas and institutes with sensitive populations.



Confirm fuel conditions will support burning in the flaming phase and avoid smoldering.



Conduct a test burn and confirm adequate dispersion.



Rule Review

630.04. Smoke Management Practices.

Burn managers must:

- a. **Burn Day Confirmation.** Prior to ignition:
 - i. Ensure the intent to burn notification required by Section 631.02 was completed;
 - ii. Ensure the ignition is occurring within the ten (10) day period of the intent to burn notification; and
 - iii. Confirm that no restrictions or limitations are in place that would prohibit or limit the burn project. Confirmation of the burn day designation may be made prior to arriving at the project location to ensure the burn decision is accessible and current;
- b. **Wind Direction Confirmation.** Prior to ignition, at the project location, confirm that the wind direction will avoid impacting smoke sensitive areas and institutions with sensitive population locations as defined in Section 006;
- c. **Fuel Conditions.** Prior to ignition, at the project location confirm fuel conditions will support adequate combustion; and
- d. **Test Burn.** If burning multiple piles, conduct a test burn to confirm adequate vertical and horizontal smoke dispersion and adequate fuel burning rate that promotes consumption of fuel by flaming phase before proceeding with additional burning.

9 Short Duration Pile Burning

The intent of the short duration pile burning category is to provide for prescribed fire of small sized projects to proceed with limited interaction with the Department and low administrative burden on the burner, or burn manager. This category of burning is designed with activities such as annual stand maintenance or other small-scale logging operations in mind where the amount of slash generated as fire hazard fuels are low in volume and generate material that is primarily in the size range of 4” or less.

Inclusion of material greater than 4” in diameter in Short Duration Pile Burning must be intentionally limited to the greatest degree possible in order to be determined a hand pile. A hand pile will contain little to no dirt. This will keep the pile open to plenty of oxygen and promote complete combustion and will aid in limiting smoldering. Hand piles are relatively small in size and are expected to be fully burned within one day. The size of a hand pile should be no larger than 20’ across x 10’ wide x 10’ high.



Rule Review

631. Short Duration Pile Burning.

Short duration pile burning is any use of prescribed fire to burn piled slash or woody debris material by any person in quantities of three thousand (3,000) cubic feet of slash material, or two point five (2.5) tons of slash material, or less per day. Short duration pile burning contains natural vegetative material that would reasonably be assumed to have been created by hand piling. Each hand pile is expected to be fully consumed within twenty-four (24) hours.

To help burn managers who are conducting short duration pile burning and understand steps required to comply with the rule, DEQ has developed a “timeline” to highlight when burners will need to complete various steps in the registration and burning process.



Figure 20 Timeline for Accomplishing Short Duration Pile Burning

9.1 Registration – Short Duration Pile Burning

Burn managers conducting short duration pile burning will need to register prior to conducting their prescribed burns. Simply complete the necessary IDL Notice of Forestry Practice or Certification of Compliance forms as required. DEQ will acquire your project information from this submittal and process as the registration. DEQ may be able to process the registration before the 30 day window.

If a burner does not submit the forms to IDL, they can submit a registration to DEQ instead at least 30 days prior to planned ignition. For instance if you are planning to burn sometime during the first week of November, burn managers will need to register with DEQ in the first week of October.

If a burner is registering with DEQ rather than relying on the IDL Notice of Forestry Practice or Certification of Compliance, registrations are accepted online and in paper form. Burners who register online with the Department must also submit a signed copy of the registration form as soon as possible. DEQ is available to assist burn managers conducting Short Duration Pile Burns who do not have internet access or are having trouble navigating the online registration process. The following information is required for registration (IDAPA 58.01.01.632.01.b):

- Burn manager name and contact information including phone number and email
- Project name or unique project identifier – can be any name that is unique to the project. For example, if the burner has several projects in the same area, name them with the burner's name, project location, and a number – Johnson-Lowman 1, Johnson-Lowman 2, etc.
- Burn location (elevation, lat/long, address)
- Land owner name
- Project details including: size and number of piles, and method of construction for piles (such as hand pile, dozer, or grappler)
- Fuel characteristics expected such as moisture content.

Any additional information that would be helpful to DEQ when making a general burn decision should also be included on the registration form. This information may include special topographical features (e.g., canyon rims), special conditions (e.g., specific wind direction needed, prior burn knowledge), and other information the burn manager feels may be relevant.

This information will be used to analyze the potential impact to the NAAQS and public health. DEQ will evaluate short duration pile burns in conjunction with the other burns proposed in the area and the potential for other emission sources within an airshed. Meteorological conditions will also be considered when determining appropriate burn days for short duration pile burning.



Rule Review

631.01. Registration

Prior to conducting any prescribed fire, as defined in 006, all burn managers who will be conducting short duration pile burning must register each planned burn projects in accordance with 631.01.a or b.:

- a. Register each burn project by submitting the Forest Practice Act Notification or Certification of Compliance Form with the Idaho Department of Lands. The Department of Environmental Quality will receive the information from this submittal and process as the registration; or;
- b. No later than thirty (30) days before the registrants anticipated ignition date, submit the following information to the Department, using the forms provided by the Department:
 - i. Burn manager name and contact information including phone number and email address;
 - ii. Project name or unique project identifier;
 - iii. Burn location;
 - iv. Land owner name; and
 - v. Number of piles.

9.2 Burn Decision-Short Duration Pile Burning

Burn Managers conducting short duration pile burning do not need to request burn approval or notify DEQ of their intent to burn. However, before conducting short duration pile burning, burn managers must confirm burn day condition (IDAPA 58.01.01.632.02.b). Burn decisions for short duration pile burning, including restrictions or limitations, are completed by 5pm each weekday the day prior burning is being considered. Sunday and Monday burn decisions are posted by Friday at 5pm. Confirmation of burn decision should be made prior to arriving on project site to ensure the burn decision is accessible and current. This confirmation could occur as early as 5:30pm the day before the intended burn date. Figure 20 shows an example of how the short duration burn decision might be communicated.

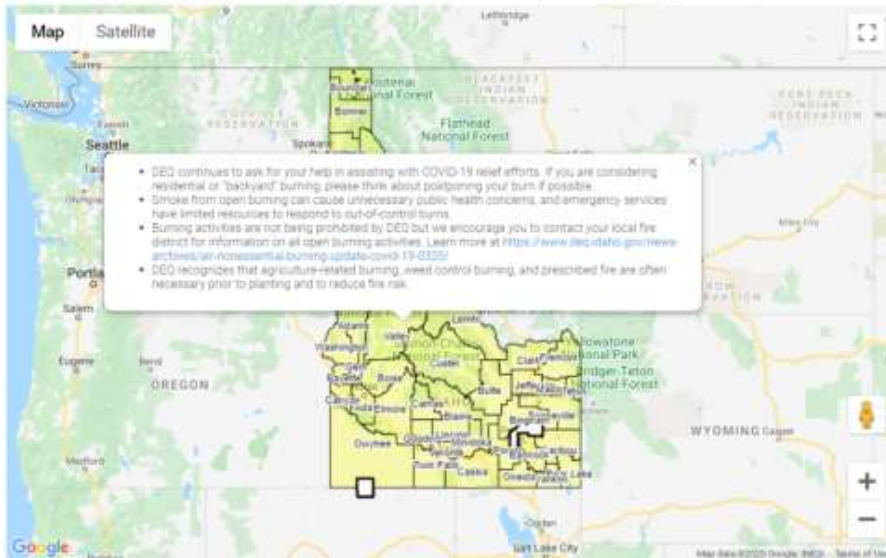


Figure 21 Short Duration Pile Burning Map Example



Rule Review

631.02 Burn Decision

The Department will post on its website the daily burn decision, any burn restrictions, and specific conditions under which short duration pile burning is limited by 5pm local time each business day for the following day. Burn decisions for weekend and holidays will be posted by 5pm local time the last business day prior to the weekend or holiday.

In addition to the map, DEQ intends to use other methods to communicate the burn decision to both the public and the burner, such as text messaging or email list-serve. When the service is available, more details will be added to this section.

Additionally, fire safety considerations may be applicable to the burn and must be considered by the burn manager. Burn manager should check with the local fire protection district prior to conducting open burning of any kind. Local ordinances which limit open burning may be in place. Burn managers are responsible to comply with local and state fire safety regulations at all times independent of smoke management decisions.

9.3 Smoke Management Practices – Short Duration Pile Burning

Although all fire practitioners should always consider following appropriate Basic Smoke Management Practices on every burn there are a few critical practices that burn managers conducting short duration pile burning must use to comply with prescribed fire rules in Idaho. Section 4 of the field guide outlines the comprehensive smoke management practices that should be considered when conducting any prescribed burn.

Before, during, and after a prescribed fire, Short Duration Pile Burning burn managers must utilize the following practices:



Prior to ignition at your project location, ensure you have confirmed no restrictions or limitations are in place that would affect your ability to burn.



Confirm that wind direction and speed will not impact smoke sensitive areas and institutes with sensitive populations.



Confirm fuel conditions will support burning in the flaming phase and avoid smoldering.



Conduct a test burn and confirm adequate dispersion so that smoke will be diluted and will avoid impacting smoke sensitive areas and institutions with sensitive populations.

There are several other basic smoke management practices that are *recommended* but not required for short duration pile burning, some of these are:

- Get a smoke dispersion forecast and review all weather conditions prior to ignition (Appendix H)
- ERTs and alternative treatments reduce the amount of fuel being burned (Section 4)
- Monitoring smoke impacts help burners learn more about how smoke disperses in their area and can inform future ignition decisions (Section 4)
- See Section 4.1.4 for more information about conducting a successful pile burn.

Smoke management practices are addressed in the suggested periodic training and here in the smoke management field guide (Section 4). Understanding of the importance of humidity, wind direction, and awareness of downwind concerns are critical to making sound burning decisions at the project's location. Online training may be taken at any time if desired. Contact DEQ if you have any specific smoke management questions to help with your burn decisions.



Rule Review

631.03. Smoke Management Practices.

Burn managers must:

- a. **Burn Day Confirmation.** Prior to ignition, confirm that no restrictions or limitations are in place that would prohibit or limit the burn project. Confirmation of the burn day designation may be made prior to arriving at the project location to ensure the burn decision is accessible and current;
- b. **Wind Direction Confirmation.** Prior to ignition at the project location, confirm the wind direction will avoid impacting smoke sensitive areas and institutions with sensitive population locations;
- c. **Prior to ignition at the project location, confirm fuel conditions will support adequate combustion; and**
- d. **Test Burn.** If burning multiple piles, conduct a test burn to confirm adequate vertical and horizontal smoke dispersion and adequate fuel burning rate that promotes consumption of fuel by flaming phase before proceeding with additional burning.

10 Prescribed Fire Rule General Provisions

10.1 Burn Decision – All Burning

In order to protect air quality while balancing the needs of many burners, DEQ will use air quality data, airshed knowledge, meteorological forecasting, and knowledge of individual burners when making a burn decision. The DEQ meteorologist will compile data regarding forecast meteorological conditions on a daily basis Monday through Friday during the burn seasons. The meteorologist will provide forecast information by airshed to the smoke management team to aid the decision process. Smoke management staff will consult several sources and take into account many criteria, in addition to the forecast, when making a decision each day.

DEQ uses the forecasted meteorological and ambient air quality conditions to ensure that prescribed fire will not cause an exceedance of the National Ambient Air Quality Standards. DEQ forecasts air quality conditions daily. When developing the forecast air quality conditions, DEQ uses several parameters (see Appendix I for more details and a full list of tools), including:

- Current air quality;
- Expected emissions from all sources on the date of burning;
- Proximity of other burns within the area to be affected by the proposed burn;
- Characteristics of proposed burn including moisture content of fuel, size of burn, and fuel loading; and
- Weather and smoke dispersion forecast model results.
- The proximity and potential impact of the proposed burns to communities and Department-identified institutions with sensitive populations;
- The proximity and potential impact of the proposed burns to Mandatory Class 1 Areas, areas of concern determined by the Department; and
- Additional smoke management factors such as wildfire activity, emergency rule activation, or local ordinances that address open burning.



Rule Review

632.01. Burn Decision - All Burning.

The Department will evaluate the following before issuing a burn decision under Sections 627 through 632:

- a.** The forecasted meteorological and ambient air quality conditions, during the expected burning (flaming and smoldering) phase, to ensure the proposed burns will not cause or contribute to an exceedance of any NAAQS. The following parameters are considered when evaluating forecast meteorological and ambient air quality conditions:
 - i. Current air quality;
 - ii. Expected emissions from all emission sources on the date of burning;
 - iii. Proximity of other burns within the area of the proposed burn; and
 - iv. Characteristics of proposed burn including moisture content of fuel, size of burn, and fuel loading;
- b.** The proximity and potential smoke impacts of the proposed burns to smoke sensitive areas and institutions with sensitive populations; and
- c.** Additional smoke management factors such as wildfire activity, activation of the Air Pollution Emergency Rule in Section 550, or local air quality ordinances that address open burning.

10.2 Designated Burn Day

Prescribed fire is allowed unless weather conditions, air quality levels, or expected emissions require DEQ to limit or prohibit prescribed fire in a specific geographical area to protect public health. Prescribed fire shall only be conducted when the Department designates that day as a burn day, and the burn is conducted in accordance with any specific conditions under which burning is approved. If DEQ must prohibit burning or burning is not conducted in accordance with specific burning condition, this would be a violation of the prescribed fire rules.

DEQ will approve individual burns for Recognized Smoke Management Group Burning in collaboration with Recognized Smoke Management Group. Major Burning will be approved on an individual basis.

For persons conducting Minor Burning or Short Duration Pile Burning, DEQ will only designate the day as a burn day or a no burn day and list any conditions under which any prescribed fire must be conducted. Individual burns will not be approved or prohibited.

There may be times when DEQ will need to limit burning to prevent exceeding the air quality standards and to protect public health. This will be accomplished by approving burns on an individual basis in the Recognized Smoke Management Burning category and Major Burning category. For Minor and Short Duration Pile Burning, DEQ may choose to allow prescribed fire but limit how much burning can be done by each burner. For example, DEQ may forecast that a geographical area can withstand some smoke but not all the smoke that could be produced by the amount of burning that is proposed. In this case, DEQ may limit all burners to a smaller volume of burning to allow everyone the opportunity to burn.



Rule Review

632.02. Designated Burn Day.

- a. The Department will designate each day a burn day or no burn day. Prescribed fire will be allowed unless weather conditions, air quality levels, and the intensity of expected emissions are such that the Department must limit or prohibit prescribed fire in a specific geographical area to protect public health.
- b. The Department will issue a separate burn decision for each type of burning conducted in accordance with Sections 628-631.

10.3 Limitations on Burning

Burning may occasionally need to be limited after a prescribed burn has begun. For example, DEQ's burning conditions may state that if burning begins to adversely impact institutions with sensitive populations, no new ignitions may be started.

There may be times that DEQ determines that air quality is degrading and burning must stop. In those cases, DEQ will contact the burn manager and request that the burn manager cease new ignitions.



Rule Review

632.03. Limitations on Burning.

Burn managers must:

- a. When required by the conditions of the burn decision, cease new ignitions such that the fire burns down if smoke is adversely impacting smoke sensitive areas or institutions with sensitive populations; and
- b. When contacted by the Department with a burn cessation decision, cease new ignitions such that the fire burns down.

10.4 Smoke Dispersion Forecast and Public Notification of Burn Day

During the burn season (primarily March 1st – May 30th and September 1st - November 30th each year but could change depending on climate), DEQ develops a smoke dispersion forecast for each weekday. This forecast is intended to help burn managers when making the go/no-go decision before ignition. The forecast will include a general weather discussion, expected wind conditions, anticipated ventilation conditions, smoke mixing height potential and any burning tips. The smoke dispersion forecast will be available for both North Idaho and South Idaho.

DEQ will post these forecasts, as well whether a given day is a burn day and any specific conditions under which burning may occur on it's website during the spring and fall burn seasons (March 1st – May 30th and September 1st – November 30th). DEQ will post burn decision information that is specific to each burn type category. DEQ will also provide a map of registered burn, as well as the location of expected Major and Minor Burning that is expected to occur each day.

When email and text service is available, interested burners may request to be added to the distribution list. Interested members of the public may sign up to receive automatic email updates regarding prescribed fire decisions.



Rule Review

632.04. Smoke Dispersion Forecast and Public Notification of Burn Day.

- a. The Department will post on its website a smoke dispersion forecast for each day during the spring and fall burn seasons. The smoke dispersion forecast is intended to assist burn managers in making decisions that support good smoke management practices. The forecast will include a general weather discussion, expected wind conditions, anticipated ventilation conditions, smoke mixing height potential, and any burning tips.
- b. A map depicting the location of all burns registered with the Department will be provided.
- c. Each day, the Department will post on its website whether a given day is a burn day and any specific conditions under which burning may be limited.
 - i. This burn day information will be specific to minor burning and short duration pile burning conducted in accordance with Sections 630 and 631.
 - ii. The location of each major burning project approved for each day will also be provided.
 - iii. The Department will also provide a link for information to all approved recognized smoke management group burning projects each day.
- d. The Department will provide an opportunity for interested persons to sign up to receive automatic e-mail updates for information regarding prescribed fire decision.

10.5 Advisory Committee

In order to maintain a robust smoke management program that meets the needs of the Department, the burners, and all citizens of Idaho, an advisory committee will meet no less than once per year to discuss the program. The Committee will consist of members from a wide variety of groups interested in prescribed fire. Each year, the Committee will discuss the burning accomplished during the preceding year, any issues that arose, a multi-year outlook for expected burning, smoke management training curriculum and courses, and changes that may need to be made to either this Field Guide or the rules. A yearly review allows for timely revisions to be considered and adopted as necessary.

The Department and advisory committee members will attempt to ensure appropriate organizations and citizens are represented adequately on the Advisory Committee. Representatives from each of the following groups will be pursued. If multiple representatives from a particular group are interested in participating on the committee, considerations for eligibility will be made by the existing committee members:

- Forest owners
- Logging contractors
- State and Federal land management agencies
- Idaho Department of Lands
- Idaho Department of Environmental Quality
- Environmental and Health organizations
- Prescribed fire advocacy groups
- Regional county or city representatives



Rule Review

632.05. Advisory Committee.

The Department will assemble an advisory committee to meet annually, or as needed, to discuss prescribed fire smoke management plan implementation and recommended improvements. The committee will consist of representatives from Idaho prescribed fire stakeholder groups including:

- i. Forest owners;
- ii. Logging contractors;
- iii. State and Federal land management agencies;
- iv. Idaho Department of Lands;
- v. Idaho Department of Environmental Quality;
- vi. Environmental and Health organizations;
- vii. Prescribed fire advocacy associations;
- viii. Regional county or city representatives; and
- ix. Others as recognized.

11 Prescribed Fire Council

Prescribed fire councils connect individuals from local, state, and federal agencies and institutions, non-governmental organizations, and the private sector who use prescribed fire as a land management tool. Councils assist prescribed fire users, policy makers, regulators and citizens. Prescribed fire councils can be instrumental in raising awareness for the need to safely use prescribed fire. Councils can be leveraged to provide public outreach, education opportunities, identification of funding opportunities for alternate disposal methods, and support for prescribed fire users. DEQ anticipates a Prescribed Fire Council will ultimately be established in Idaho. Updates to this section will be made when council is established.

12 Smoke Management Training

In order to provide the opportunity for the most successful prescribed fire smoke management burn decisions in Idaho, burn managers are highly encouraged to participate in training. DEQ expects training to be made available to all burn managers as the program matures.

Burn managers conducting Recognized Smoke Management Burning or Major Burning are likely to have completed training sponsored by the NWCG, such as RX410, RX310, or the Burn Boss Refresher. The Department will pursue providing an on-line training course for burn managers who do not have access to NWCG training opportunities. Training for prescribed fire should cover the following topics:

- Fire weather
- Fire behavior
- Firing tools and techniques
- Fuel moisture
- Burn planning
- Topography
- Burning laws and regulations
- Safety and equipment; and
- Smoke management, including the following:
 - Prescribed fire rules and general DEQ rules.
 - Burner responsibilities and requirements.
 - DEQ responsibilities and requirements.
 - General air quality protection and smoke management.

The Smoke Management Advisory Committee will be responsible for identifying specific training courses and identifying curriculum content. The committee will work with LEAP, University of Idaho, and the Idaho Prescribed Fire Council to develop and host training opportunities and content.

An example of topics covered in a smoke management training course can be found at : https://www.fdacs.gov/content/download/4747/file/cpb_lesson_unit2_smoke_mgmt.pdf (copy and paste this UL in a web browser.) Training developed for Idaho could be expected to cover similar topics.

Acronyms

AQI	Air Quality Index
BSMP	Basic Smoke Management Practices
DEQ	Department of Environmental Quality
ISP	Institutions with Sensitive Populations
NAAQS	National Ambient Air Quality Standards
PM	Particulate Matter
SOP	Standard Operating Procedure

Glossary

Airshed - geographic area that, because of topography, meteorology and/or climate, is frequently affected by the same coherent air mass and therefore all parts of the area are subject to similar conditions of air pollution

Broadcast Burning – a prescribed burn where fire is applied to wildland fuels within well-defined boundaries for the purpose of fuel hazard reduction and/or resource management.

Burn Manager – the individual responsible for a prescribed burn from ignition through completion or their designee.

Emergency Rule – DEQ is authorized to manage and remedy pollution levels that may constitute a health emergency. Emergency criteria apply to any situation or circumstance where pollutants reach, or are predicted to reach and persist at, potentially unhealthful levels.

Exceptional Event - exceptional events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state or local air agencies may implement in order to attain and maintain the National Ambient Air Quality Standards (NAAQS). Exceptional events may include wildfires, high wind dust events, prescribed fires, stratospheric ozone intrusions, and volcanic and seismic activities.

Forest landowners - includes large industrial landowners who own and manage land primarily to grow raw material for the timber products industry. Also includes small, non-industrial landowners for whom financial return may not be the primary management focus, and homeowners who value their forested acreage primarily as a place to live.

Fuel Loading – the amount of flammable material in a given area, usually measured as tons per acre.

Institute with Sensitive Populations -schools while in session; hospitals; residential health care facilities for children, the elderly or infirm; and other institutions with sensitive populations as approved by the Department.

Major Burning – major burning is any use of prescribed fire to burn slash by any person, as defined in IDAPA 58.01.01.006 in quantity greater than 34,000 cubic feet of material, or 30 tons slash material per day, or any amount of broadcast type burning of natural or activity fuels.

Mandatory Class I Areas - the Clean Air Act gives special air quality and visibility protection to national parks larger than 6,000 acres and national wilderness areas larger than 5,000 acres that were in existence when it was amended in 1977. These are “Class I” areas. Idaho has multiple Mandatory Class I areas – Craters of the Moon Wilderness Area, Hells Canyon Wilderness Area, Sawtooth Wilderness Area, Selway-Bitterroot Wilderness Area, and Yellowstone National Park.

Minor Burning - minor burning is any use of prescribed fire to burn piled slash or woody debris by any person, as defined in IDAPA 58.01.01.006, in quantities greater than 3,000 cubic feet of slash material, or 2.5 tons of slash material per day and less than 34,000 cubic feet slash material, or 30 tons slash material per day.

National Ambient Air Quality Standards – the Clean Air Act requires U.S. EPA to set standards for pollutants that are considered harmful to the public and environment.

Non-Attainment Area – areas that have been designated by EPA as not meeting the NAAQS.

Particulate Matter – a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. PM10 and PM2.5 are two inhalable particles present in smoke.

Pile Burning – a prescribed burn used to dispose of wildland fuels that result from fuel and/or resource management activities which were piled by hand or machine.

PM2.5 – particulate matter that is smaller than 2.5 microns. PM2.5 is easily inhaled into the respiratory system and can pass into the bloodstream.

Prescribed fire - (IDAPA 58.01.01.006.89) - the controlled application of fire to wildfire fuels in either their natural or modified state under such conditions of weather, fuel moisture, soil moisture, etc., as will allow the fire to be confined to a predetermined area and at the same time produce the intensity of heat and rate of spread required to accomplish planned objectives, including:

- Fire hazard reduction
- The control of pests, insects, or diseases
- The promotion of range forage improvements
- The perpetuation of natural ecosystems
- The disposal of slash and woody debris resulting from a logging operation, the clearing of right of way, a land clearing operation, or a driftwood collection system

- The preparation of planting and seeding sites for forest regeneration, and
- Other accepted natural resource management purposes

Recognized Smoke Management Group Burning – recognized smoke management group burning is any use of prescribed fire to burn slash and natural fuels by any person, as defined in IDAPA 58.01.01.006, that is a member in good standing of a recognized smoke management group.

Regional Haze Rule – requires that states develop and implement comprehensive plans to reduce human-caused regional haze in designated areas.

Short Duration Pile Burning - short duration pile burning is any use of prescribed fire to burn piled slash or woody debris material by any person, as defined in IDAPA 58.01.01.006, in quantities of 3,000 cubic feet of slash material, or 2.5 tons of slash material or less per day. Short duration pile burning contains natural vegetative material that would reasonably be assumed to have been created by hand piling. Each hand pile is expected to be fully consumed within twenty-four (24) hours.

Smoke Dispersion Forecast – a weather forecast that is specific to the location of a prescribed burn. The forecast includes surface and transport wind speed and direction, mixing height, and ventilation.

Smoke Management Program – a program wherein meteorological information, fuel conditions, fire behavior, smoke movement and atmospheric dispersal conditions are used to schedule the location, amount and timing of open burning, including prescribed fire, to minimize the impact of burning on identified smoke sensitive areas and populations and to ensure smoke impacts do not cause or contribute to a violation of the National Ambient Air Quality Standard (NAAQS) in order to protect public health.

Smoke Ready Community or Smoke Readiness – residents understand the health risks of smoke exposure and have access to information and tools to protect themselves. Resources are on hand to help vulnerable and underserved residents.

Smoke Sensitive Areas – areas in which smoke from outside sources is intolerable, for reasons such as heavy population, existing air pollution, intensive recreation or tourist use, or institutes with sensitive populations.

Test burn – ignition of some, but not all, fuel to observe how smoke disperses. Test burn should be representative of the project. If there are multiple piles, ignite one pile and observe smoke. Adjust ignition as necessary to achieve desired objectives.

Wildland Urban Interface - the Wildland Urban Interface (WUI) is the transition zone between unoccupied land and human development. Of the 6,410,000 acres under direct state protection, 2,856,000 (45%) has been designated by the counties as WUI. The remaining 3,554,000 acres (55%) are classified as wildland.

Appendix A: How to Register Burn Projects

This appendix will provide instructions for burners to submit registrations. Below is an example form burners will use to register their burning projects. This example would be used by persons conducting major burning and those conducting minor and short duration burning if the burner is not relying on an IDL Notification of Forestry Practice or Certificate of Compliance for registration of their project. This will not be fully developed until the rule has been accepted and DEQ builds its online portal.

Depending on resources and agency agreements, DEQ plans to allow registration of burn projects for minor and short duration burning via the IDL Notification of Forestry Practice process, via an online portal, and on paper when necessary. If a burner needs to register via the online portal, they would likely need to:

1. Create an online burner account by clicking “create a new account”
2. Input information from the registration form example.
3. Submit the form.
4. DEQ will review the information provided. If DEQ needs additional information, they will contact the burn manager within 2 weeks of receiving the registration.
5. If the project will be conducted as Major Burning, DEQ may contact the burn manager to schedule a coordination call to discuss burn specifics and help the burn manager plan the best day for ignition.



FOR OFFICIAL USE ONLY
 DEQ Application # _____
 Region _____
 Year _____
 Application Tonnage: _____
 Date Received: _____
 IDL FPA Notice #: _____
 Mapped _____

Prescribed Fire Registration Form

Registration Form Instructions

1. Use this application if you are registering your prescribed fire project including: piled forest material, "Broadcast" or "Understory" burn
2. Fill out the application completely. Must be printed legibly using blue or black ink.
3. Sign and date the application. Mail, email, or drop off the application to your DEQ Regional Office.

Section 1 – Burn Manager Information The burn manager is the individual responsible for a prescribed burn from ignition through completion.

- 1.1** Name: _____ Primary Phone: _____
 Email: _____ Alternate Phone: _____
 Mailing Address: _____
 City: _____ State: _____ Zip code: _____
- 1.2** Contact Plan (*Major Burning Only*) During periods of emergency episode curtailment, or when smoke is creating an adverse condition, DEQ may need to contact the Landowner or Burn Manager. Please list how DEQ should contact the responsible party –
 Contact Person: _____ Primary Phone: _____
 Alternate Phone: _____

Section 2 – Burn Location

- 2.1** Project Name (Unique Project Identifier): _____
- 2.2** Legal Description: _____ ¼ of _____ ¼ of the Section _____ Township _____ Range _____ or
- 2.3** Street Address _____
- 2.4** Latitude/Longitude in decimal degrees. Latitude: _____ (i.e.: 47.12556)
 Longitude: _____ (i.e.: -123.22546)

There are several acceptable ways to obtain the latitude and longitude including: Google Maps Google Earth GPS unit (NAD 83 datum)

- 2.3** Elevation of burn (if burn spans a large area on a slope, use lowest elevation): _____
- 2.6** County or Airshed (if known) where burning will occur: _____

Section 3 – Burn Information

- 3.1** Burn Type: ☐ Pile (piled fuels) ☐ Broadcast (or Understory) (non-piled fuels -Created as a result of human activity or found "as-is" as natural fuels)
- 3.2** Project Type: ☐ Short Duration
☐ Minor
☐ Major (Includes all Broadcast or Understory burning)
- 3.3** Fuel Characteristics
 Pile Burns = Estimate number of piles _____ and size of piles (LxWxH) _____
 Broadcast Burns = Total acres of project _____ and tons of fuel per acre _____
 Fuel Condition Piles = Approximate how many months drying since being cut and piled _____
 Fuel Condition Broadcast = Expected percent live fuels, _____ anticipated dead fuels _____

Pile Construction Method = (hand, grappler, dozer, etc.): _____

Section 4 – Additional Information (Optional)

This information is option but may help DEQ make a more informed decision about burn approval.

- 4.1** Check all that apply to your burn:
- | | <u>Distance</u> | <u>Direction</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| <input type="checkbox"/> Burn is within 500 feet of one or more residences which are not owned by the landowner of the property where the proposed burn will occur. | _____ | _____ |
| <input type="checkbox"/> Burn is within 3 miles of an Institution with Sensitive Populations from the property where the proposed burn will occur. | _____ | _____ |
| <input type="checkbox"/> Burn is within 100 feet of a state or federal highway, county road or railroad, or other public road. | _____ | _____ |
| <input type="checkbox"/> Burn is within 5 miles of a smoke sensitive area other areas of frequent concentrated public use. | _____ | _____ |
| <input type="checkbox"/> Piles are covered. | | |
- 4.2** Planned ignition time _____
- 4.3** How long do you expect your burn to last, include active flaming phase and smoldering (hours)?
 Flaming _____ Smoldering _____
- 4.4** ☐ I have an IDL Certificate of Compliance deadline that will soon expire and can no longer be extended. Provide the Certificate of Compliance # and date of original and latest expiration date: _____

The information provided is true and accurate to the best of my knowledge

Signature of Landowner/Landowner Agent _____

Date _____

Mail the registration to your local DEQ Regional Office or drop off in person.

What Happens Next? DEQ will evaluate your registration and may contact you to clarify registration responses, obtain additional information and/or to schedule a site visit. When you are ready to execute your burn, check the applicable prescribed burn map, request approval, or notify DEQ of your intent to burn based on your burning type per IDAPA 58.01.01.627-632.

DEQ Boise Regional Office 1445 N. Orchard St. Boise, ID 83706 ph: (208) 373-0550 fx: (208) 373-0287 toll-free: (888) 800-3480	DEQ Coeur d'Alene Regional Office 2110 Ironwood Parkway Coeur d'Alene, ID 83814 ph: (208) 769-1422 fx: (208) 769-1404 toll-free: (877) 370-0017
DEQ Idaho Falls Regional Office 900 N. Skyline Drive, Suite B Idaho Falls, ID 83402 ph: (208) 528-2650 fx: (208) 528-2695 toll-free: (800) 232-4635	DEQ Lewiston Regional Office 1118 F St. Lewiston, ID 83501 ph: (208) 799-4370 fx: (208) 799-3451 toll-free: (877) 541-3304
DEQ Pocatello Regional Office 444 Hospital Way, #300 Pocatello, ID 83201 ph: (208) 236-6160 fx: (208) 236-6168 toll-free: (888) 655-6160	DEQ Twin Falls Regional Office 650 Addison Avenue West, Suite 110 Twin Falls, ID 83301 ph: (208) 736-2190 fx: (208) 736-2194 toll-free: (800) 270-1663

Appendix B: How to Make a Burn Request for Major Burning

This appendix will provide instructions for persons conducting Major Burning to request burn approval for their burning projects. This process will not be fully developed until the rule has been accepted and DEQ builds its online portal or establishes other options. Depending on resources and availability, DEQ plans to support burn requests via email, online, and/or text messaging. *The instructions provided below are just an example of how an online burn portal could work. This is intended to be used for discussion and is not representative of a final product.*

If you are submitting your burn request via the DEQ Prescribed Fire Online Portal, use the following instructions:

1. Go to DEQ prescribed burning website: “XXwebsite”
2. Login to your account on the Prescribed Burn system and choose “Make a Burn Request” (details on how to create an account will be provided in instructions for registration).
3. From the supplied list for this account, click on the burn project you wish to make a request for.
4. Enter the date you wish to burn. You must make a request by noon local time, at least one business day before you wish to burn. If your request is received after that deadline, you risk not being approved for burning the next day.
 - a. For example, if you wish to burn on Tuesday, October 23rd, you will have to make a request by noon local time on Monday, October 22nd. If you make your request after noon, you will not likely be approved to burn Tuesday, October 23rd. Your request would be considered for Wednesday, October 24th or any other future date.
 - b. If you wish to put in your request more than one business day in advance, your burn request will not be considered and reviewed and a burn decision determined until one business day prior to ignition. If today is October 23rd and you put in a request for Saturday, November 2nd, your request will not be reviewed until Friday, November 1st and a burn decision will be posted by 6pm, Friday November 1st.
5. Check the box for email or text message notice if you would like to receive your burn decision via email or text message. *If you do not wish to receive an email or text message, you will be responsible for checking DEQ’s Prescribed Burn map for the burn decision or you will need to call the DEQ Prescribed Burning hotline.*

6. Submit request to DEQ.
7. DEQ will review the request and make a decision no later than 5pm local time one business day before the requested burn date. DEQ will post their decision on the Prescribed Burning website, as well update the DEQ Prescribed Burning hotline. Those who have chosen to receive email or text message notification will receive an email or text message at 5pm local time one business day before the requested burn date.

If you are submitting your burn request via email or text message, use the following instructions:

1. Open your email account or a new text message.
2. Enter the DEQ Prescribed Fire Request Email (prescribedfire@deq.idaho.gov) into the “To” line of either your email or text message.
3. Enter the following information into the body of the email or text:
 - a. Project Identifier
 - b. Burn Manager name if changed since registration
 - c. Updates to the burn plan since registration
 - d. Additional information that you think may be helpful for the burn decision
 - i. Fuel loading or acreage changes
 - ii. IDL hazard abatement deadlines
 - e. How you would like to receive your burn decision notification:
 - i. Email
 - ii. Text
 - iii. You will check the Prescribed Fire Map
4. Send your email or text.
5. If you chose email or text notification, DEQ will notify you of your burn decision in this manner.

Appendix C: How to Notify DEQ of Intent to Burn for Minor Burning

This appendix will provide instructions for persons conducting Minor Burning to notify DEQ of their intent to burn their piles. This will not be fully developed until the rule has been accepted and DEQ builds its online portal or establishes other options. Depending on resources and availability, DEQ plans to allow notification of intent to burn via email, online, and/or text messaging.

The instructions provided below are just an example of how an online burn portal could work. This is intended to be used for discussion and is not representative of a final product.

If you are submitting a Notification of Intent to Burn via the online portal, use the following instructions:

1. Go to DEQ prescribed burning website: “XXwebsite”
2. choose “Notify DEQ of Intent to Burn”
3. Enter in the IDL notification number or the unique project identifier created when registering with DEQ
4. Enter the date you wish to burn. You must make a notice by noon local time, at least one business day before you wish to burn. If your notice is received after that deadline, you will not be approved for burning the next day.
 - a. For example, if you wish to burn on Tuesday, October 23rd, or for the following 9 days, you will have to notify DEQ by noon local time on Monday, October 22nd. If you make your notification after noon, you will likely not be allowed to burn Tuesday, October 23rd. Your notification would be considered for Wednesday, October 24th and for the following 9 consecutive days.
 - b. If you wish to put in your notification more than one business day in advance, know that a burn decision for your area will not be determined until one business day prior to ignition.
 - c. If you do not complete your burn within the 10 day window established at the time of notification to burn, you must repeat the process to notify the department of your intent to burn.
5. Check the box for email or text message notice if you would like to receive the burn decision for your area via email or text message. *If you do not wish to receive an email, you will be responsible for checking DEQ’s Prescribed Burn map for the burn decision or you will need to call the DEQ Prescribed Burning hotline.*

6. Submit your Notification to DEQ.
7. DEQ will review the notice. DEQ will post the burn decision on the Prescribed Burning website, as well as the DEQ Prescribed Burning hotline. Those who have chosen to receive email or text message notification will receive an email or text message at 5pm local time one business day before the requested burn date.
8. Burners will be responsible for checking the map and/or hotline before beginning ignition. Submitting a Notice of Intent to Burn does not mean burning is always allowed. There will be times that DEQ or another agency has issued a burn ban because of air quality weather or fire safety. Additionally, DEQ may issue burning restrictions such as limits on the total volume of burning allowed per burner.

If you are submitting your Notification of Intent to Burn via email or text message, use the following instructions:

1. Open your email account or a new text message.
2. Enter the DEQ Prescribed Fire Email Address into the “To” line of either your email or text message.
3. Enter the following information into the body of the email or text:
 - a. Project Identifier
 - b. Burn Manager name if changed since registration
 - c. Additional information that you think may be helpful for the burn decision
 - i. Pile sizes and quantity;
 - ii. Estimated moisture content of fuel;
 - iii. Estimated time of ignition;
 - iv. Duration of burn; and
 - v. Idaho Department of Lands hazard fuel abatement deadlines.
 - d. How you would like to receive your burn decision notification:
 - i. Email
 - ii. Text
 - iii. You will check the Prescribed Fire Map
4. Send your email or text.
5. Regardless of how you want to receive the burn decision, DEQ will send a reply email or text message to acknowledge receipt of your Notification.
6. DEQ will review the notice. DEQ will post the burn decision on the Prescribed Burning website, as well as the DEQ Prescribed Burning hotline. Those who have chosen to

receive email or text message notification will receive an email or text message at 5pm local time one business day before the requested burn date.

7. Burners will be responsible for checking the map and/or hotline before beginning ignition. A Submitting a Notice of Intent to Burn does not mean burning is always allowed. There will be times that DEQ or another agency has issued a burn ban because of air quality or weather. Additionally, DEQ may issue burning restrictions such as limits on the total volume of burning allowed per burner.

Appendix D: Meteorology Considerations for Burn Managers Making Smoke Management Decisions

Some general guidelines to follow when reviewing weather and smoke forecasts and for deciding whether to propose and/or begin ignition include but are not limited to:

- Fuel is dry and has cured for at least 5 months
- “Very Poor” ventilation conditions should be avoided.
- Surface and transport wind speeds should be considered in relation to upwind communities and smoke sensitive areas in order to lessen impacts.
- Wind direction should be considered to decrease impacts on cities and smoke sensitive areas.
- Low mixing heights and very low wind speeds are poor conditions for smoke management especially in populated areas. As the mixing height decreases, burns should be spaced further apart.
- Burning when relative humidity is >90% often creates poor smoke management conditions as it may inhibit smoke dispersion and affect fuel consumption rates.
- Burns near populated areas should be completed early to avoid producing smoke overnight and trapping it near ground level by radiation inversions.
- Use geographical features to act as barriers for limiting smoke transport to populated areas or use as a mechanism to increase vertical smoke transport.

Appendix E: Burn Managers: Determining if ignition is appropriate

The intent of this appendix is to provide burners a decision making process for ensuring that burning is allowed and appropriate before ignition. *The instructions provided below are just an example and are not indicative of a final product.*

1. If you are a burner conducting a Major or Minor burn: Check the appropriate DEQ Prescribed Fire Map to be sure that burning is still allowed and make note of any burning restrictions or limitations listed for your burn or your burn area which is defined by county or other geographical boundary. Even if DEQ gave you approval the night before the planned ignition, there is a small chance that air quality deteriorated overnight and conditions require burning to be limited.
 - a. **Green**: if your specific burn, or the area in which you are burning is colored Green, there are no restrictions on burning.
 - b. **Yellow**: if your specific burn, or the area in which you are burning is colored Yellow, there may be some restrictions or limitations to burning. Make note of any restrictions or limitation that apply to your burn.
 - c. **Red**: if your specific burn, or the area in which you are burning is colored Red, burning is not approved. Clicking on the burn or area will tell you the reason it is not allowed such as a local ordinance restricting burning or an Emergency Episode is in place.
2. If you are conducting Short Duration Pile Burning: Check the DEQ Open Burning Map (link) to determine if open burning is allowed in your burn area.
 - a. **Green**: air quality supports burning
 - b. **Yellow**: air quality may not support burning. Check for restrictions or limitation in your area.
 - c. **Red**: air quality does not support burning. Burning is not allowed.
3. For Recognized Smoke Management Group and Major Burning review a smoke dispersion forecast for local weather conditions before beginning ignition (even if you have received approval from DEQ and IDL and your smoke management group),. If you are conducting Minor or Short Duration Burning, reviewing a smoke dispersion forecast is highly recommended. Appendix H explains how to get a forecast. Section 4.1 explains what the weather criteria mean for burning.
4. Determine if local conditions match the forecast and are supportive of good smoke dispersion.
5. If you have more than one pile or are broadcast burning, conduct a test burn before beginning a full ignition. Observe smoke dispersion and determine if smoke is dispersing well. If not, cease further ignitions and wait until conditions better support smoke dispersion. Igniting a burn prior to the inversion lifting will result in less than optimal

smoke dispersion conditions. Be aware of when an inversion is expected to lift for the day so you can correctly interpret the smoke conditions.

6. If you only have one pile to burn and local conditions support burning, begin ignition and observe smoke dispersion.
7. Stop ignition at intervals to determine if smoke is still dispersing well before continuing ignition of multiple piles.

Appendix F: How to Submit Burn Report

This appendix will detail instructions for submitting how many acres/piles were burned the day after the burn was approved. This will not be fully developed until the rule has been accepted and DEQ builds its online portal. *The instructions provided below are just an example and are not indicative of a final product.*

If you are conducting Major or Minor Burning:

1. Go to the DEQ Prescribed Burning website “XXwebsite”
2. Login to your prescribed burner account.
3. Click on the burn project that you completed.
4. Fill out the required fields:
 - a. Enter the total acreage burned (if broadcast burning) or total cubic feet of piles burned.
 - b. Enter any burning notes such as observed weather and smoke dispersion. **This field is not required for Minor Burning but is recommended*
 - c. Update any details of burn if needed (e.g. fuel loading was higher/lower than originally estimated or fuel condition was different than expected).
5. Submit burn report to DEQ.

Appendix G: Developing a Public Awareness Strategy

This appendix will detail how to develop a public awareness strategy. This appendix will not be fully developed until the rule has been accepted and DEQ builds its online portal. *The instructions provided below are just an example and are not indicative of a final product.*

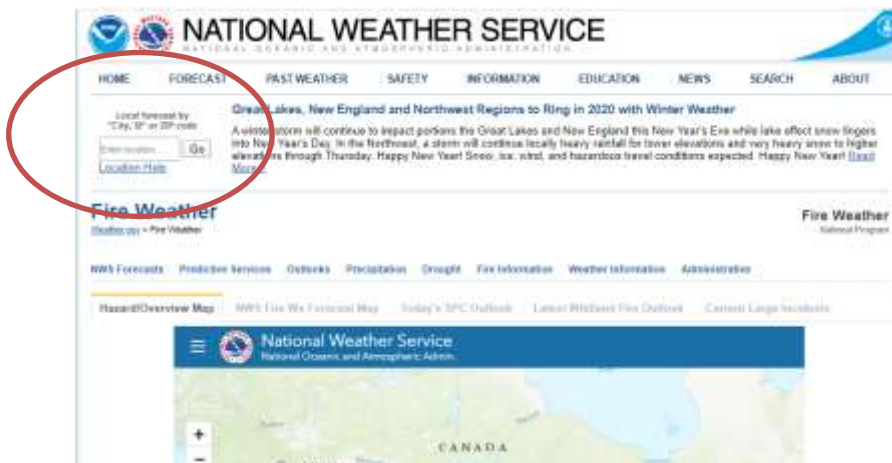
The more the public knows about burning – when it will occur, why it needs to be done, the benefit to the ecosystem, the benefit to the local economy, etc. – the more likely they are to be accepting of any smoke produced. When developing a public awareness plan, burners should ask themselves the following questions:

- Who do I need to tell about my burn (neighbors that might be impacted, local and state officials, etc)?
 - How will I tell them?
 - What should I tell them?
 - When should I tell them?
1. Using the DEQ Prescribed Burning Map, locate your burn on the map and click on the flag.
 2. A circle will appear that will show a _X_ mile radius around your burn.
 3. Determine if there are any “institutes with sensitive populations” (ISPs) within your burn radius.
 4. Use the DEQ Prescribed Burn Public Awareness Toolbox to print/email a notice of burning to deliver to all the ISPs within your burn radius.
 5. Use the DEQ Prescribed Burn Public Awareness Toolbox to notify any residential neighbors within _X_ miles of your burn.
 6. The more the public knows about burning – when it will occur, why it needs to be done, the benefit to the ecosystem, the benefit to the local economy, etc. – the more likely they are to be accepting of any smoke produced.
 7. In addition to notifying neighbors and ISPs of your intention to conduct prescribed burning, check with your local governments to determine if you need to notify any local agencies such as fire protection agencies when you begin ignition.

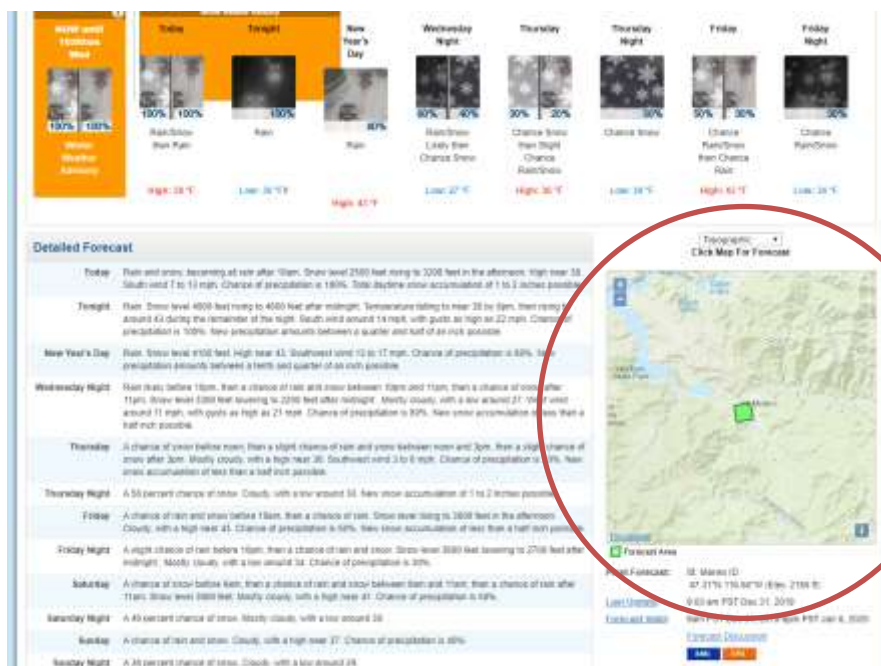
Appendix H: How to get a Smoke Dispersion Forecast from NWS

Bookmark the NWS Fire Weather webpage for easy use in the future: www.weather.gov/fire. Follow these simple steps to get a smoke dispersion forecast before planning or starting an ignition:

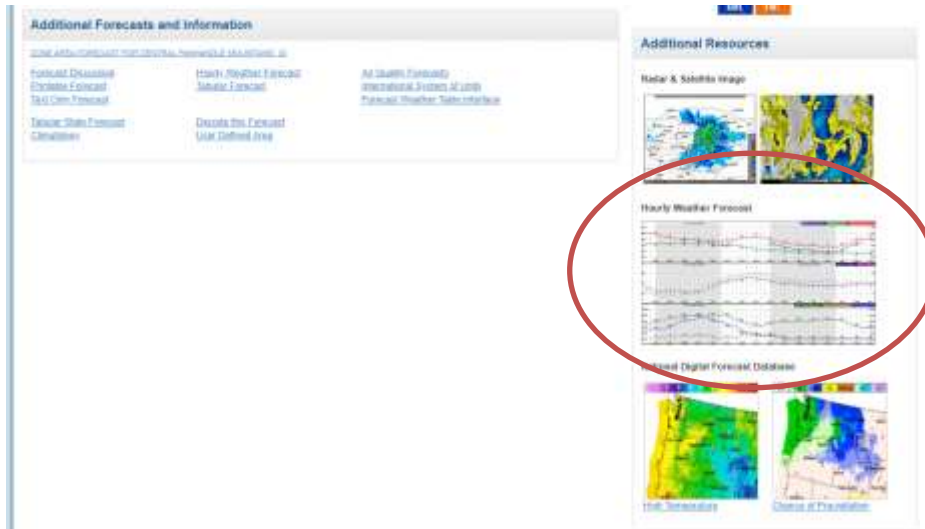
1. On the NWS Fire Weather page, type in the closest town in the search bar at the top left of the page. Click “Go”



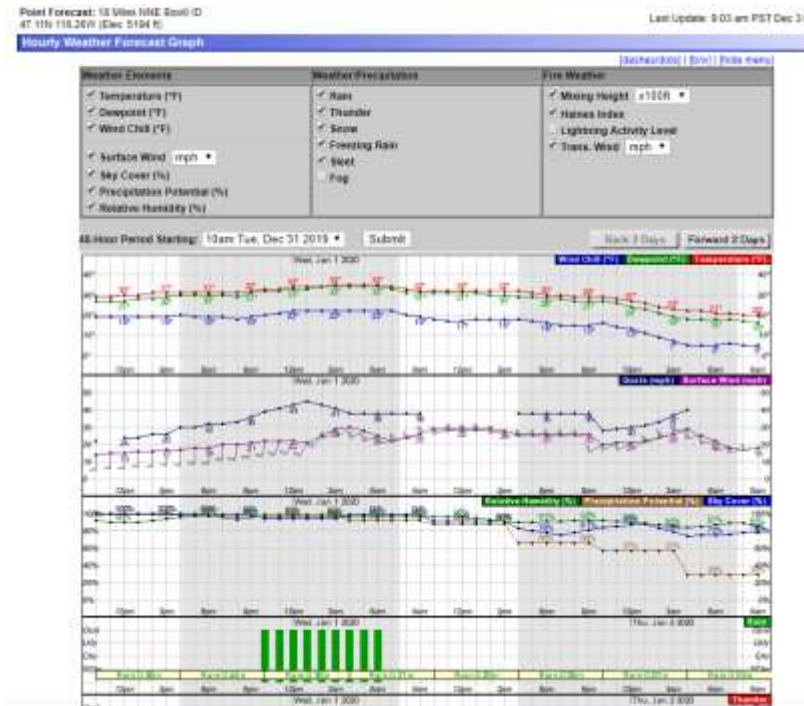
2. Scroll down the page and use the map to click on your actual location.



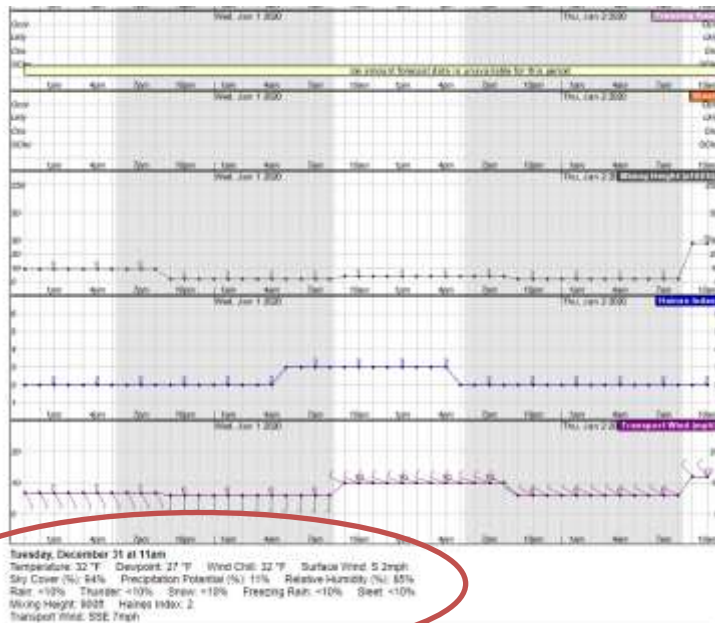
3. Once you have precisely pinpointed your fire location (or favorite fishing hole), scroll down and click on the “Hourly Weather Graph” under “Additional Resources” in the lower right of the page.



4. The check boxes at the top of the graphs or table allow you to specify the particular elements and weather parameters you want to see, ranging from relative humidity to mixing height and transport speed. Make sure the following boxes are marked (most should be automatically marked and you will only need to add a couple):
 - a. Temperature
 - b. Surface Wind
 - c. Precipitation Potential
 - d. Relative Humidity
 - e. Mixing Height
 - f. Haines Index
 - g. Trans. Wind
5. Hit the “Submit” button and the graphs or table will display the weather forecast at your exact location.



6. Scroll to the bottom of the screen and as you move your mouse across the graph (without clicking), the specific data will show at the bottom of the graph for easy quick reference for specific times (such as the time you plan to ignite)



7. Use the data provided to analyze the ideal burn window for your burn. The forecast weather MAY NOT support good smoke dispersion and burners should not burn in those conditions. Section 4.1.1 explains how to evaluate the forecast conditions.

Appendix I: How DEQ Makes a Burn Decision

Knowledge of a particular airshed, its population density, its geographical features, and the proximity of the proposed prescribed burns allows staff to determine how much smoke the area can handle without adverse impacts. Some areas of the state have a very low population, generally favorable weather, and geographical features that support ventilation, as well as a low number of proposals. These airsheds will support more burning with limited smoke impacts. Conversely, areas of the state near smoke sensitive populations, with highly variable weather conditions, and geographical features that increase the chance of trapping smoke overnight will need greater levels of airshed coordination to accomplish land management goals while protecting air quality.

For example, proposed burns near a smoke sensitive site, like St. Maries or Pinehurst, will need adequate ventilation and the correct wind speed and direction in order to be approved. Proximity to other burning in the area could also further restrict a proposal.

Burns proposed near bodies of water or in valley drainages will need to take other considerations, such as the lake effect or overnight conditions, into account. Time of ignition and limiting the acreage could also increase the success of such a proposal.

Sometimes, weather conditions such as inversions or a stable atmosphere will need to be accounted for. Burning below an inversion will trap smoke whereas burning above the elevation of an inversion will allow smoke to dissipate. Similarly, smoke will need to adequately ventilate before nighttime inversions set up, trapping smoke overnight near communities.

In order to protect air quality while balancing the needs of many burners, DEQ will use air quality data, airshed knowledge, meteorological forecasting, fuel conditions and knowledge of individual burners when making a burn decision. The DEQ meteorologist will compile data regarding forecast meteorological conditions on a daily basis Monday through Friday during the burn seasons. The meteorologist will provide forecast information by airshed to the smoke management team to aid the decision process. Smoke management staff will consult several sources and take into account many criteria, in addition to the forecast when making a decision each day.

DEQ will use the following criteria to inform their decision. They may use additional tools not listed below.

- Air quality monitors
- Proximity to communities and/or impact zones
- Proximity to other proposed burns
- Proximity to Mandatory Class 1 Areas.
- Size of proposed burn – acreage and tons per acre

- Elevation of burn
- Duration of proposed burn
- Number of burns proposed per airshed (cumulative burning considerations)
- Knowledge of member burner
- Local knowledge of airshed activity provided by regional AQ staff
- Potential sources of additional emissions – wildfire, wood stove, crop residue burning, etc.
- Possible presence of an Emergency Episode
- Local open burning restrictions
- Anticipated overnight impacts to area
- Geographical considerations that may impact drainage
- Other burning and stationary emission sources

Tools and information sources that staff may use include but are not limited to:

- Bufkit
- NWS Forecast Discussion
- NWS Spot weather forecasts
- Hysplit Trajectory
- Bluesky
- Idaho DEQ Open Burning Map
- AirFire Tools
- Idaho DEQ Real Time Monitors
- Pacific Northwest Environmental Forecast and Observations tools
- DEQ meteorologist forecast discussion

Meteorological conditions that are taken into considerations include:

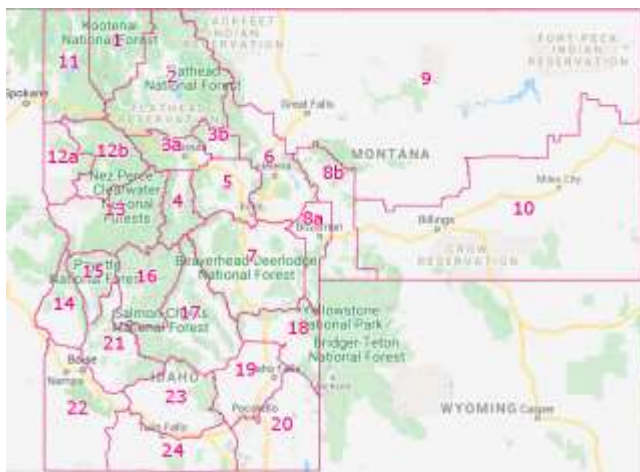
- Sky/weather
- Temperature
- Humidity
- Wind – surface and transport
 - Speed and direction
- Mixing height
- Ventilation

Appendix J: DEQ General Smoke Forecast

This appendix will include an example of the DEQ General Smoke Forecast that will be provided daily during the spring and fall burn season. We have included a copy of the RX Dispersion Forecast that DEQ develops for our internal decision making process for the Montana Idaho Airshed Group. Currently, we break up the forecast into North and South Idaho. Northern Idaho includes Airsheds 11-13. Southern Idaho includes Airsheds 14-24. Airsheds 1-10 are in Montana.

This forecast and map below is included as an EXAMPLE only. DEQ plans to develop a new Prescribed Fire Map for Major, Minor, and Short Duration burning.

Map of Airshed Boundaries



Forecast for North Idaho Airsheds

RX DISPERSION FORECAST: 10/29 AM

SMOKE DISPERSION FORECAST for NORTHERN IDAHO

Forecast Prepared by: IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

Forecast Time Prepared: 10:00AM PDT – Tuesday October 29, 2019

Forecast for: Wednesday October 30, 2019

GENERAL WEATHER DISCUSSION:

WEDNESDAY:

Wednesday will continue to be dry and unseasonably cold under northerly flow aloft as an eroding ridge moves in from the Pacific. Clear skies, cold air, strong inversions, light winds, and a ridge aloft will set the stage for some valley air stagnation issues beginning Tuesday night and lasting through the week. Surface winds will remain calm to light from the southwest to southeast. Transport winds will be light from the southwest to south. Mixing heights will range from 1,000 to 2,000 feet AGL. Ventilation will be limited to good in the afternoon with locally poor areas throughout.

NORTH IDAHO BY AIRSHED:

Air Shed 11:

Forecast for WEDNESDAY:

SKY/WEATHER: Sunny.

TEMPERATURE: High temperatures ranging from 25-40 degrees.

HUMIDITY: Minimum RH around 25-40 percent.

WIND -SURFACE: Calm to light southwest winds.

-TRANSPORT: Calm to south to southwest winds at 3-8 mph.

MIXING HEIGHT: Air mass will become unstable to around 1,000 to 2,000 feet AGL.

VENTILATION: Limited to good in the afternoon with locally poor areas.

Air Shed 12A:

Forecast for WEDNESDAY:

SKY/WEATHER: Sunny.

TEMPERATURE: High temperatures ranging from 30-45 degrees.

HUMIDITY: Minimum RH around 20-30 percent.

WIND -SURFACE: Calm to light southwest to southeast winds.

-TRANSPORT: Calm to light south to southwest winds.

MIXING HEIGHT: Air mass will become unstable to around 1,000 to 2,000 feet AGL.

VENTILATION: Limited to good in the afternoon with locally poor areas.

Air Shed 12B:

Forecast for WEDNESDAY:

SKY/WEATHER: Sunny.

TEMPERATURE: High temperatures ranging from 30-45 degrees.

HUMIDITY: Minimum RH around 25-40 percent.

WIND -SURFACE: Calm to light southwest to south winds.

-TRANSPORT: Light south to southwest winds.

MIXING HEIGHT: Air mass will become unstable to around 1,000 to 2,000 feet AGL.

VENTILATION: Limited to good in the afternoon with locally poor areas.

Air Shed 13:

Forecast for WEDNESDAY:

SKY/WEATHER: Sunny.

TEMPERATURE: High temperatures ranging from 25-45 degrees.

HUMIDITY: Minimum RH around 25-40 percent.

WIND -SURFACE: Calm to light southwest winds.

-TRANSPORT: Calm to light southwest winds.

MIXING HEIGHT: Air mass will become unstable to around 2,000 feet AGL.

VENTILATION: Limited to good in the afternoon with locally poor areas.

EXTENDED WEATHER OUTLOOK: Thursday October 31, 2019







Thursday may see some clearing of the stagnant conditions as a shortwave trough moves southeast through Montana and temporarily flattens out the ridge aloft. There is not much energy associated with this system so impacts are expected to be limited to high clouds during the day on Thursday. Winds may not increase enough to scour the valley inversions. By evening a return to ridging aloft will bring more stagnant conditions until at least the weekend. Surface winds will be from the

southwest to west at 2-5 mph. Transport winds will be from the southwest to west at 3-10 mph. Mixing heights will range from 1,000 to 3,000 feet AGL. Ventilation will be good to excellent in the afternoon with locally limited areas.

END...Brian Himes - AQ Meteorologist

Appendix K: Air Quality Index

An easily accessible way to understand air quality is to use the AQI. AQI stands for Air Quality Index. It's a simple way to communicate air quality and how it might affect public health. Burners can check nearby air quality at DEQ's real time air quality monitoring website: <http://airquality.deq.idaho.gov/>.

Range		Category	Meaning
		Good	Air quality is considered satisfactory, and air pollution poses little or no risk
51 to 100		Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
101 to 150		Unhealthy for Sensitive Groups*	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
151 to 200		Unhealthy	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
201 to 300		Very Unhealthy	Health warnings of emergency conditions. The entire population is more likely to be affected.
301 to 500		Hazardous	Health alert: everyone may experience more serious health effects.